LOGY DEPARTMENT

THE PAPER INDUSTRY and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE—MARCH, 1949

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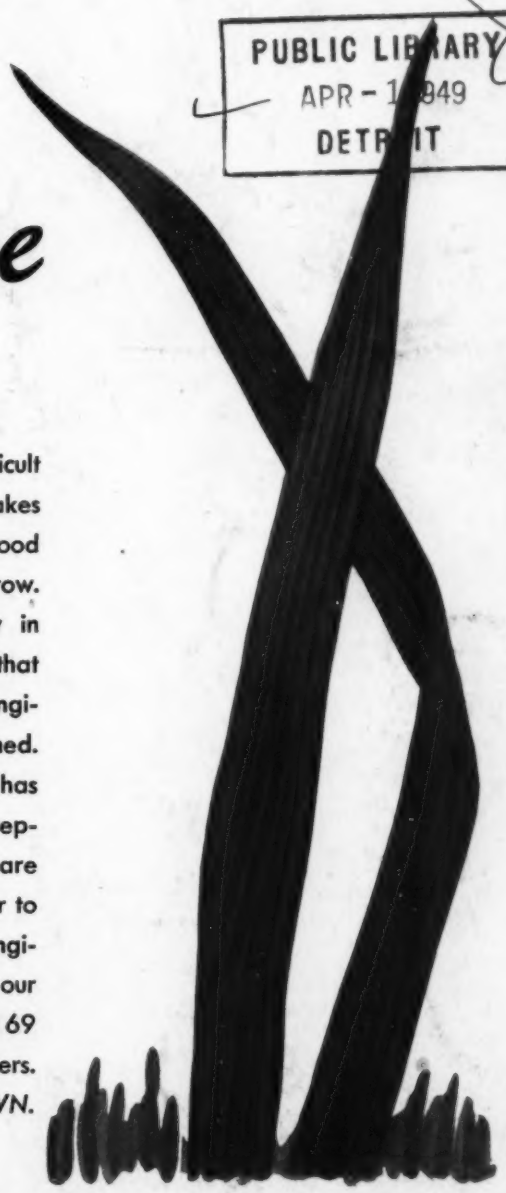
DETROIT

Two NOW GROW WHERE ONLY *One* GREW BEFORE...

Any horticulturist will tell you that one of the most difficult types of gardening is the cultivation of a lawn. It takes long and proper preparation of soil, the planting of good seed, and painstaking care after the seeds begin to grow.

We're not horticulturists, but we see the analogy in building a competent personnel in business. It's been that way with us. In the early days of Downingtown, our engineering staff was small, but carefully selected and trained. And, like the blades of grass, our engineering staff has multiplied in number. Today, after long and proper preparation, good planting of knowledge and painstaking care of sound engineering, we are better equipped than ever to fulfill your needs . . . quickly. And this "cultivated" engineering staff has the added advantage of drawing on our vast, fertile "reservoir of knowledge" built up during our 69 years of designing and building machinery for paper makers. *Another "reason why" for coming to DOWNINGTOWN.*



DOWNINGTOWN MANUFACTURING COMPANY

DOWNINGTOWN, PA.

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY SINCE 1880

Don't let the bottom drop out of your market...

WET-STRENGTHEN your paper with Uformites

"If it isn't wet-strength paper I don't want it!" Before customers begin saying that to you, safeguard your market—wet-strengthen your paper with the UFORMITES.

Without special equipment—for as little as $4 per ton of paper—the UFORMITES boost wet Mullen values by 300%! And at the same time, they increase wet rub and scuff resistance, improve wet and dry tensile, fold, and the printing characteristics of coated paper.

Actually, you'll save money by making a better product. For the UFORMITES not only let you use lower-grade pulps without sacrificing paper quality, they also improve the sizing efficiency of rosin and improve retention of beater additives. If you make paper toweling, the UFORMITES eliminate the see-saw relationship of wet strength and absorbency. And in twisting tissue, the wet-strength resins prevent breakage on paper-twisting machines.

Whether you manufacture towels, bags, reproduction, or printing papers, glassine, greaseproof wrappings, or twisting tissues, you'll profit from using the UFORMITES. Write today for full details and samples of these urea formaldehyde resins.

Handy Facts on Wet Strength
Your copy of this free booklet will answer your technical questions about the UFORMITES, and how they are used to increase wet strength. Write for it today.

AMBERLITE W-1—a water-soluble polymer for improving the dry and wet tensile and Mullen, as well as the fold, and the abrasion resistance of paper.

RHOZYMES BB and E-5—for enzyme conversion of starch.

TAMOL P—for effective pitch control—a dispersing agent for pigments.

TRITONS—surface-active agents with a score of uses in paper manufacture—in caustic cooking of cotton fiber, as a dispersing agent for pigments and metallic soaps, emulsion-type coatings.

The Hydrosulfites—reducing agents for stripping color from rag stock or for bleaching pulp.

HYAMINES—deodorants for paperboard and glue bactericides.

UFORMITE, RHOZYME, TAMOL, TRITON, AMBERLITE are trade-marks, Reg. U. S. Pat. Off.

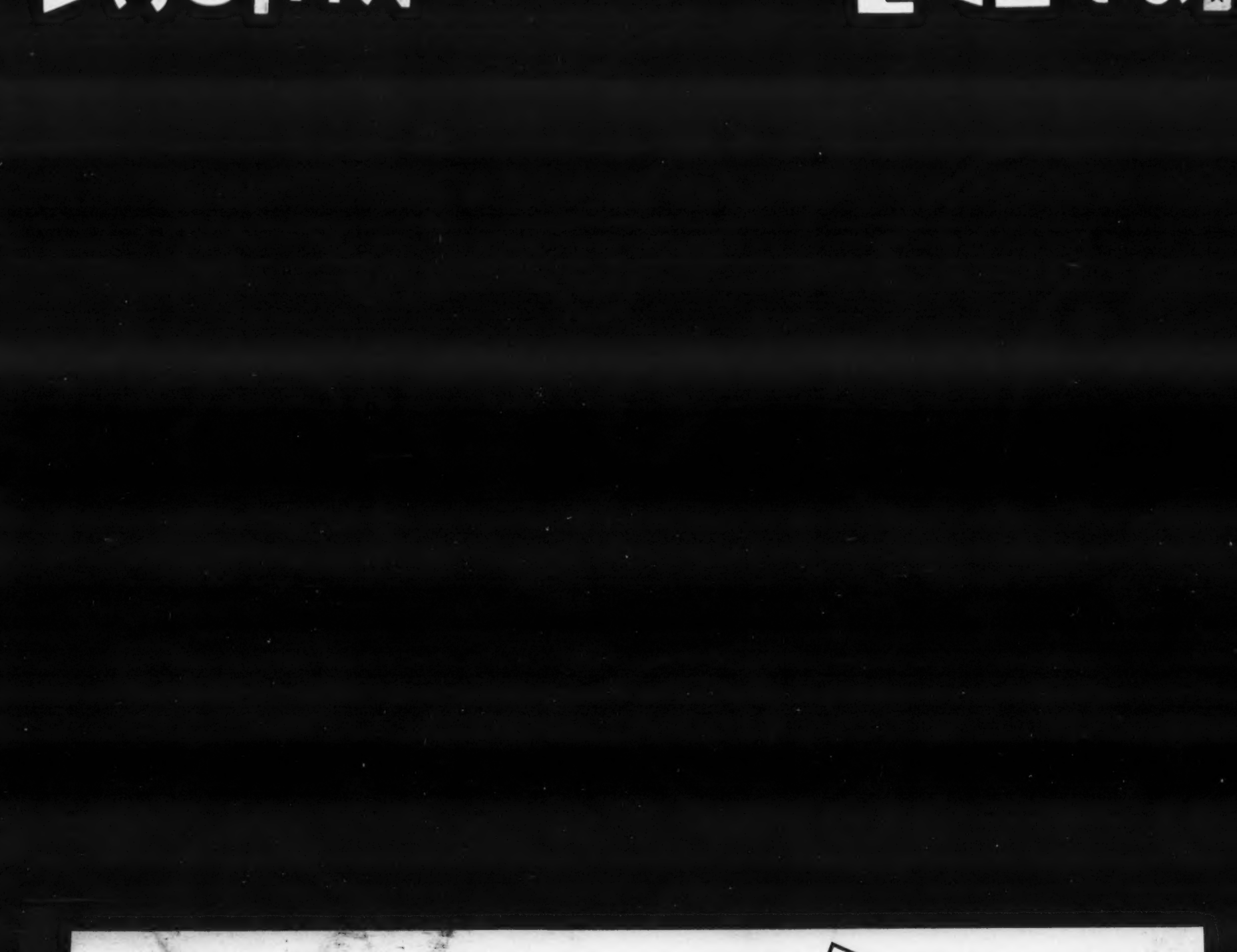
CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square Philadelphia 5, Pa.

The Resinous Products Division was formerly The Resinous Products & Chemical Company



"TEXROPE VARI-PITCH SPEED CHANGERS Boosted Our Output"

"With these clean, compact units we can change speeds without stopping, get in-between speeds we need," says spinning mill foreman.

STEP UP MACHINE OUTPUT in *your* plant with the same variable speed drive that makes spinning mill foreman Ralph Finkboner of Rochelle, Illinois so enthusiastic. Texrope Vari-Pitch Speed Changers give you smooth, accurate speed control at the turn of a crank. You operate your machines at exactly the right speed for highest production. You change to different speeds for different types of material in seconds.

V-belt drive cushions Texrope Vari-Pitch Speed Changers against shock loads. Design is simple, compact, smooth running and easy to keep clean. Capacities range from 1 to 75 HP with stepless speeds up to 3.75 to 1.

The Texrope line also includes Vari-Pitch variable speed drives with stationary or motion control which will solve many variable speed drive problems at low cost. For details on all Texrope drives, the most complete V-belt drive line on the market, see your A-C Authorized Dealer or District Office or write for Bulletin 20B6051G. Also in Sweet's.

Texrope Super-7 V-belts result from the cooperative research of Allis-Chalmers and B. F. Goodrich; and are sold only by A-C dealers and offices. Texrope and Vari-Pitch are Allis-Chalmers trademarks. A-2645

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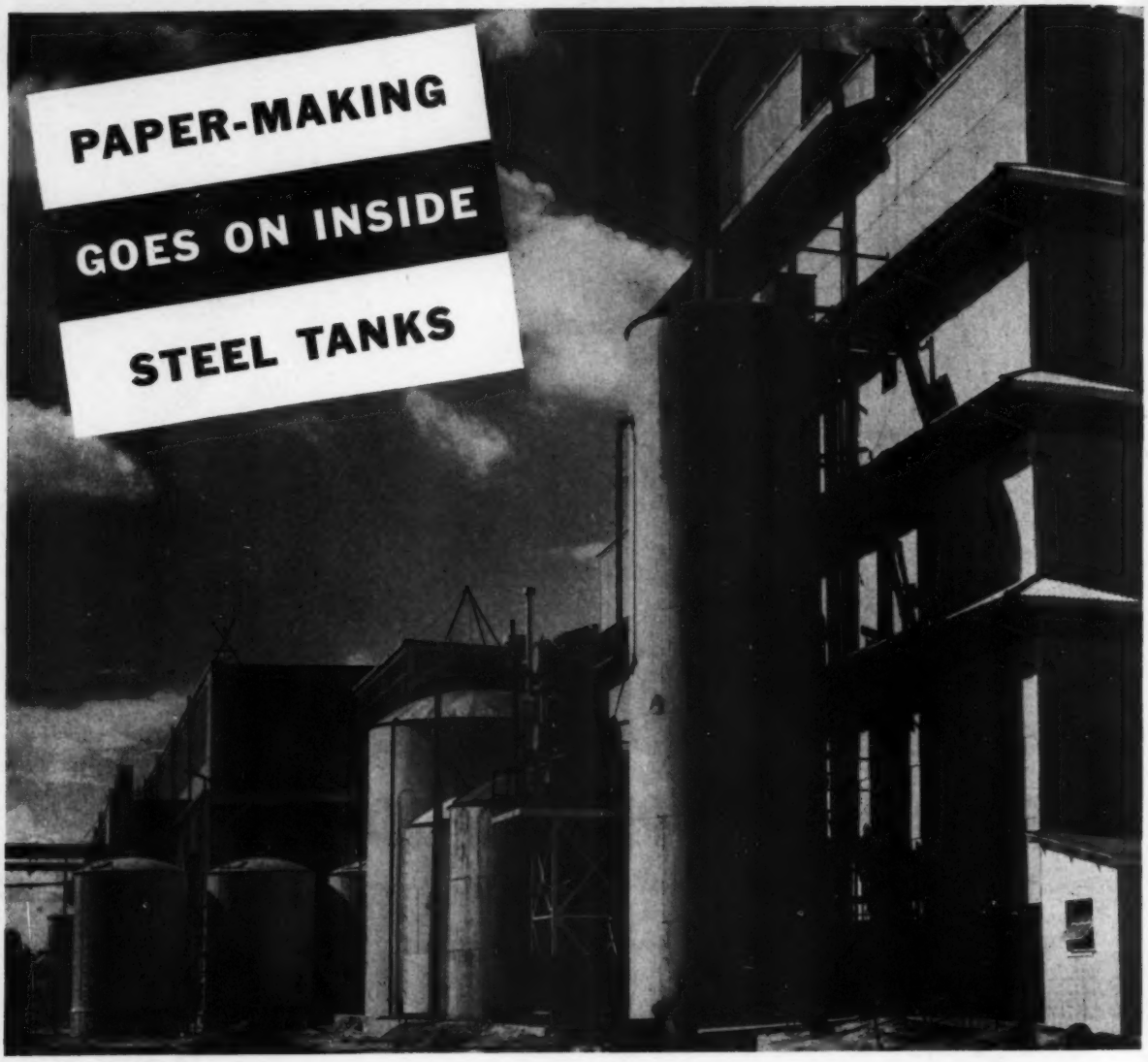

PAPER-MAKING is an industry that calls for processing or storage tanks at almost every step — a description of the pulp processes is a story of movement through various specialized containers that make up an important part of every pulp mill's production facilities. The same generalization is true in other fields, such as petroleum refining and chemical processing. And in all these fields, you will find CB&I-built steel plate work and storage tanks doing everything from the most specialized processing to the simplest storage jobs.

The list of equipment which we design, fabricate, and erect for the paper industry includes sulphate and sulphite digesters, diffusers, spherical acid accumulators, pulp washing tanks, flat-bottom storage tanks and elevated water tanks. Special non-corrosive linings are furnished when specified, and x-raying and stress-relieving are done when required by the governing codes. When your plans for new production or storage facilities call for steel plate work, ask our nearest office to work with you. We'll give you complete details and quotations.

Above: A group of flat-bottom storage tanks built for the Florida Pulp and Paper Company at Cantonment, Fla. They are, left to right, three 12-ft. diam. by 15-ft. caustic tanks; a 24-ft. diam. by 30-ft. black liquor tank; two 20-ft. diam. by 18-ft. tanks for weak liquor and hot water; and a 14-ft. diam. by 50-ft. accumulator tank.

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RICE BARTON Research Corporation

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With great pleasure we announce the formation of the Rice Barton Research Corporation, a wholly owned subsidiary of Rice Barton Corporation.

The purpose of this new organization is to conduct process and product research for the paper industry. Its further purpose is the sale and promotion of equipment which will be developed with its own resources and with the help of its many friends in the industry.

The initial step in this direction is a connection with Mr. Kurt Wandel, whereby the Rice Barton Research Corporation will further develop and sell machines basically designed by Mr. Wandel and known to the industry as "DynoMachines."

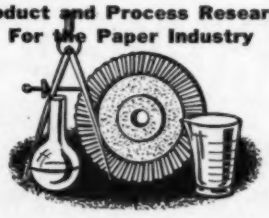
These machines - DynoPulpers, DynoFiners and DynoChests are operating most successfully in a number of mills throughout the country. Rice Barton Research Corporation is proud to have the exclusive sale and further development of this line of equipment.

In continuing advertisements we plan to bring to your attention the many advantages and achievements of these DynoMachines. We welcome your inquiries.

Charles Sumner Barton
President

RAY SMYTHE, West Coast Representative
501 Park Building, Portland 5, Oregon

Product and Process Research For the Paper Industry



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and PAPER WORLD

(Reg. U. S. Pat. Off.)

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—FEATURES—

A New Kraft Mill (St. Regis, Tacoma)		1718
Interest Is Reviving in Straw Paper Manufacture	C. G. Krancher	1741
When You Lead a Conference	Alfred M. Cooper	1745
Advanced or Preventive Maintenance	Thomas W. Estabrook	1747
Automatic Control Principles Are Demonstrated with Working Model	G. F. Akins	1748
Glycerine's Role in Paper Progress	Milton A. Lesser	1753
Paper Week		1759
APPA Annual Convention		1760
Thirty-fourth Annual TAPPI Meeting		1765
Hardy S. Ferguson . . . TAPPI Medalist		1770
Divisional Group Meetings		1772
Thirtieth Anniversary Luncheon of SAPI		1778
TAPPI Program . . . . with Convention Paper Abstracts		1808
Newsprint Paper in 1948	J. J. Zima	1822
Review and Outlook for Unbleached Kraft Paper	Dernell Every	1826
Convention Papers . . . Abridged		1827

—NEWS—

Trade Winds		1719
Associations	1759 to	1782
Safety		1782
Allied		1784
Names in the News		1792
Personals		1792
Necrology		1800

—DEPARTMENTS—

Editorial	1717
Between the Lines	1739
Paper Sketches	1757
Coming Events	1770-1772
Practical Shorts	1805
New Equipment and Supplies	1832
Technical Developments	1836
New Catalogues and Publications	1838
Current Market Quotations	1840
Index to Advertisers	1842

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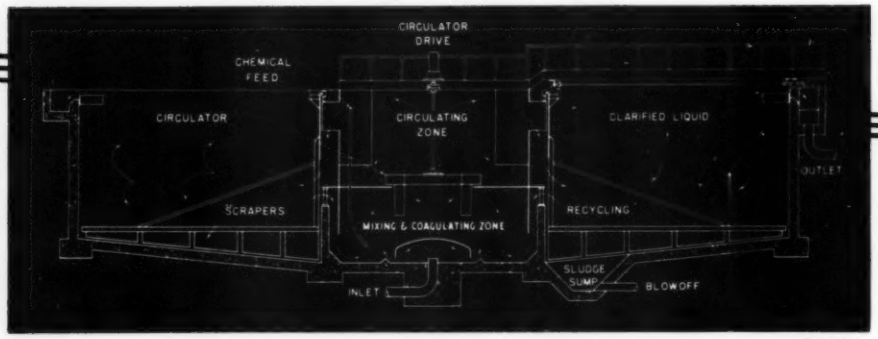
NEW White Water Treatment



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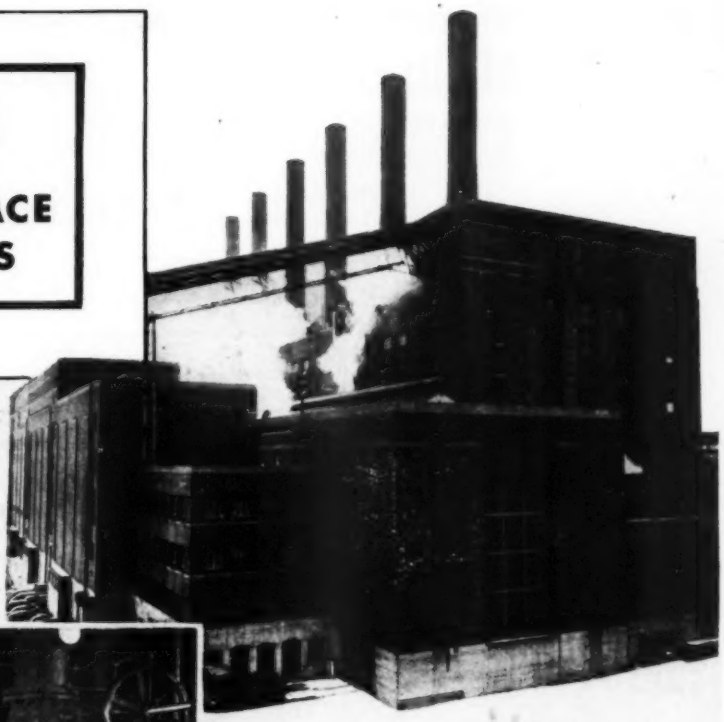
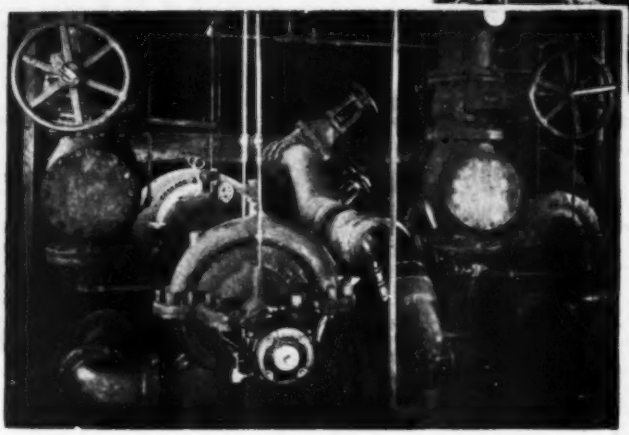
SETS THE PACE IN VALVES

"MISSISSIPPI MUD" provides proof





The Union Electric Company, whose plants generate electric energy for distribution to both industrial and domestic consumers in St. Louis, Mo. and adjacent territory, is using OIC Valves extensively in its new 400,000 KW plant at Venice, Ill.

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WHEN Union Electric built the first unit of their plant at Venice, Ill., OIC Valves — and others — were used in the pump house during the unwatering of the caisson. These valves were continuously subjected to raw Mississippi River water with its high turbidity and consequent severe scouring action.

The OIC Valves came through with flying colors!

When Union Electric needed additional valves, both for temporary use and for permanent installations, OIC Valves were selected.

Hundreds of similar experiences show why, day by day, OIC is becoming known as "Pace-Setter in Valves"!

Check These Pace-Setting Features!

- Leak-proof joints guard against disastrous pressure-drop.
- Streamlined designs protect flow from turbulence.
- Heavier construction throughout keeps pressures and stresses within safe bounds.
- Wedges of heavy I-beam design provide positive, leak-proof closure, or open the streamlined ports for smooth, even, *free* flow!
- Integral body ribs guide the wedge to its seats with unerring accuracy — effectively reduce vibration and wear.

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Write For Handy OIC Cross Reference Chart — Eliminates Valve Change-Over Problems

Simply check the number of the valve you wish to replace, look at the chart, and you'll find the right OIC valve. Write to The Ohio Injector Company, Wadsworth, Ohio, for your free copy.

OIC VALVES

STEEL • IRON • BRONZE

CHEMICAL USERS' GUIDE To General Chemical Products for the Paper Industry

PRODUCT	AVAILABLE FORMS	COMMERCIAL STRENGTH (MIN.)	SHIPPING CONTAINERS	APPLICATIONS
Aluminum Sulfate $Al_2(SO_4)_3 \cdot 14H_2O$ approx. *(Alum)*	Commercial & Iron Free: Lump, Ground Powdered	17.25% Al_2O_3	Bags Bulk Carloads	Precipitation of rosin size and filler; water clarification; manufacture of satin white; pitch control; mordant for dyes.
Aluminum Sulfate $Al_2(SO_4)_3$ + water *(Liquid Alum)*	Liquid	32° Be (total Al_2O_3 7.2%)	Tank Trucks Tank Cars	Same as commercial dry product but lower strength.
Salt Cake Na_2SO_4 *(Sodium Sulfate)*	White or Grayish Granules	95-99% Na_2SO_4	Bags Bulk Carloads	Used in kraft cooking liquors as the source of Na_2S.
Glauber's Salt, Crystal $Na_2SO_4 \cdot 10H_2O$ *(Sodium Sulfate)*	Colorless Crystals	96% $Na_2SO_4 \cdot 10H_2O$ (42.3% Na_2SO_4)	Bags Barrels	Substitute for salt cake in kraft cooking liquor.
Glauber's Salt, Anhydrous Na_2SO_4 *(Sodium Sulfate)*	White Granules	99.5% Na_2SO_4	Bags Bulk Carloads	Same as Crystal but stronger product.
Sulfuric Acid H_2SO_4	Liquid	66° (93.19%), 99% 20% oleum and higher strengths	Carboys Steel Drums Tank Trucks Tank Cars	Wire scouring; parchmentizing; acid wash in last stage of multi-stage pulp bleaching; neutralizing tall oil soaps.
Sodium Thiosulfate $Na_2S_2O_3 \cdot 5H_2O$ *(Hypo)*	Colorless Crystals	99.75% $Na_2S_2O_3 \cdot 5H_2O$	Bags Fibre Drums	Anti-chlor.
Sodium Sulfite, Anhydrous Na_2SO_3 *("Sulfite")*	White Powder	98.5% Na_2SO_3	Bags Fibre Drums	Anti-chlor.
Sodium Silicate $Na_2O \cdot XSiO_2$ + water *(Water Glass)*	Liquid	38°, 41°, 42° Be; special and higher strengths	Steel Drums Tank Cars Tank Trucks	Adhesive for corrugated and solid fibre board; used in coating mixtures to reduce viscosity and in beater sizing to stiffen paper.
Chromium Potassium Sulfate $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$ *(Potash Chrome Alum)*	Red Violet Crystals	99.5% $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$	Fibre Drums	Used in "save-all" or white water systems.
Aqua Ammonia NH_4OH + water *(Ammonia)*	Colorless Liquid	26° Be (29.4% NH_3)	Carboys Steel Drums Tank Trucks	Used with chlorine to form chloramines for slime control.
Sodium Fluoride	Powder	90% NaF 95% NaF	Barrels Fibre Drums	Preservative and stabilizer for starch in coating mixtures.
Tetrasodium Pyrophosphate, Anhydrous $Na_4P_2O_7$ *(TSPP) (Pyro)*	White Powder	98% $Na_4P_2O_7$ (Equiv. 52% P_2O_5)	Bags	Felt washing; pitch dispersion.
Nitric Acid HNO_3 + water	Liquid	42° Be 67.2% HNO_3	Carboys Drums Tank Trucks	Nitrating pulp; cleaning monel metal.
Sodium Sulfide Na_2S + water	Red Chips or Solid Mass	60% Na_2S	Steel Drums	Substitute for salt cake in modified soda process.

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FOR AMERICAN INDUSTRY

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For example, only 2% of TITANOX-A-WD in the paper through beater addition raises the opacity from 85% (unpigmented) to 90.5%, while 4% raises opacity to 93.5%.

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We will be glad to discuss with you the use of this pigment for improving your paper products. Call or write our nearest office. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; 104 So. Michigan Ave., Chicago 3, Ill.; 2600 So. Eastern Ave., Los Angeles 22, Calif. Branches in all other principal cities.

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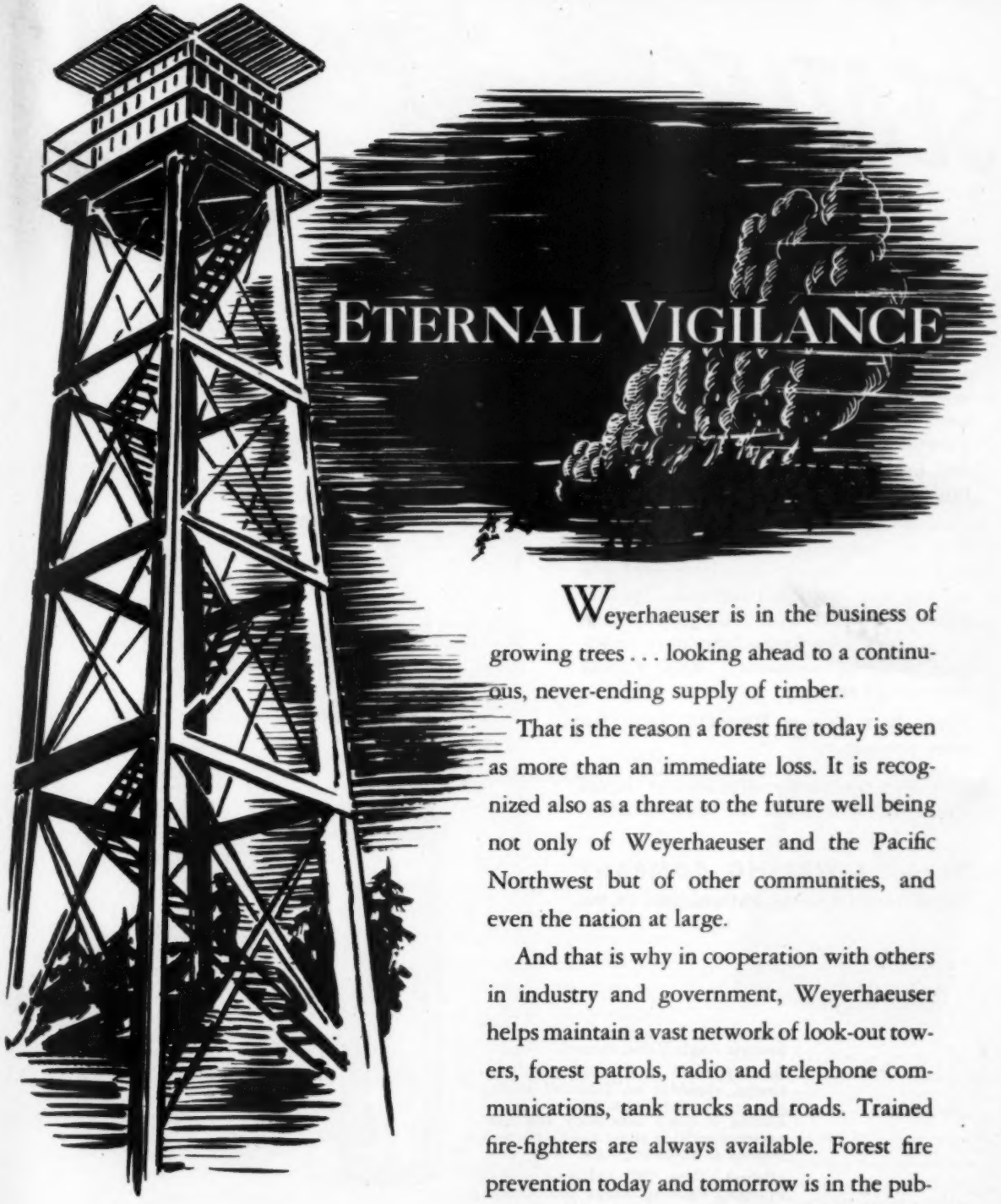
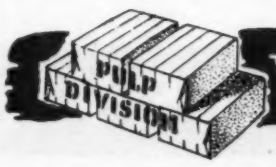


ETERNAL VIGILANCE

Weyerhaeuser is in the business of growing trees . . . looking ahead to a continuous, never-ending supply of timber.

That is the reason a forest fire today is seen as more than an immediate loss. It is recognized also as a threat to the future well being not only of Weyerhaeuser and the Pacific Northwest but of other communities, and even the nation at large.

And that is why in cooperation with others in industry and government, Weyerhaeuser helps maintain a vast network of look-out towers, forest patrols, radio and telephone communications, tank trucks and roads. Trained fire-fighters are always available. Forest fire prevention today and tomorrow is in the public interest for the present and the future.



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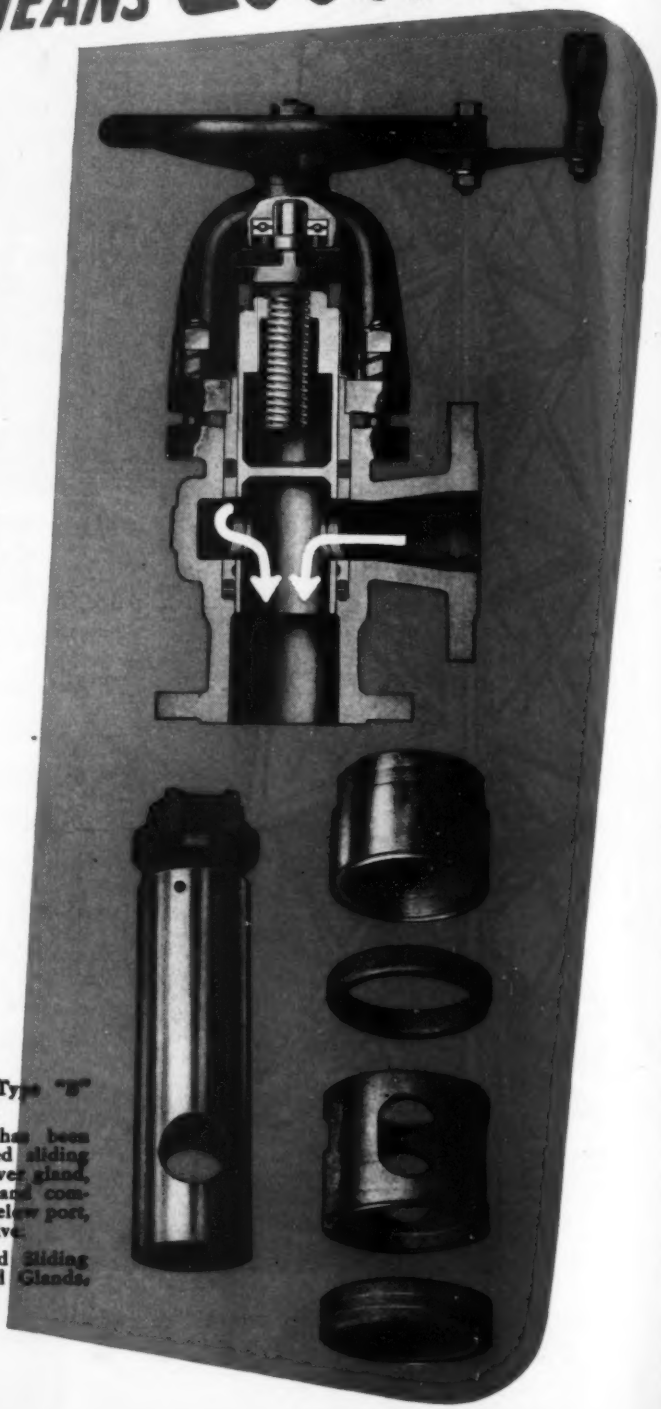


(*Above*)—Cross section of Type "B" Seatless Angle Valve, flanged.

OPERATION: After valve has been closed, shoulder on balanced sliding plunger contacts upper follower gland, forcing it down into body and compressing packing above and below port, making an absolutely tight valve.

(*Below*)—Type "B" Balanced Sliding Plunger, Packing Rings and Glands.

YARWAY BLOW-OFF VALVES

KNOCK-OUT STEAM WASTE

with Brown Flow Accounting Meters

Your costs for distribution and utilization of steam (or other fluid) will be known facts with the installation of Brown Flow Accounting Meters. Hourly and daily records from your Brown Flow Meters will enable you to know, not approximate, what is happening . . . where it is happening . . . when it is happening. You can deal a knock-out blow to waste and properly pro-rate expenses for each operation and each department. The Brown Flow Accounting System is producing sensational economies in many plants, repaying the original investment in a very short time.

Check, today, on the application of Brown Flow Accounting Meters to your processes! You can get detailed information in Bulletin 2022 . . . send for your copy!

Bulletin 2022, "Brown Flow Meters for Cost Accounting," is complete and informative. A copy will be sent to you upon request. Write today!

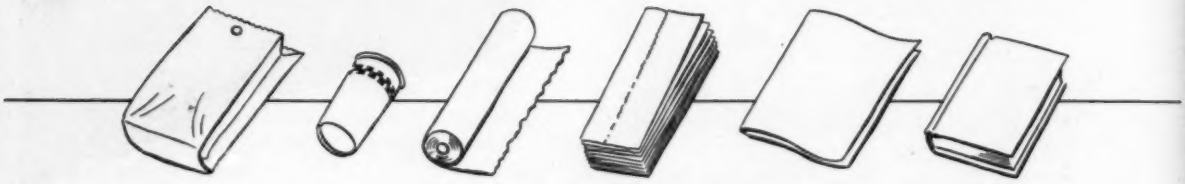
Brown Recording Integrating Flow Meters are not expensive! For example, a complete unit for a six inch steam line costs less than $500.00!

MINNEAPOLIS-HONEYWELL REGULATOR CO.
BROWN INSTRUMENTS DIVISION
4489 Wayne Ave., Philadelphia 44, Pa.
Offices in principal cities of the United States, Canada and throughout the world

BROWN *Advanced Instrumentation* FOR THE PAPER INDUSTRY
Honeywell

A Complete Program

FOR THE TESTING AND CERTIFICATION OF PAPER AND PAPER PRODUCTS

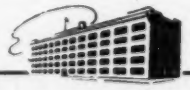


We have the facilities not only to test paper and paper products, but to Certify their quality, establish quality controls, and initiate programs for new product development.

The service and tests we perform include:

1. Wood pulp sampling and testing.
2. Analysis of materials used in paper making.
3. Determination of the fiber composition of paper.
4. Chemical analysis of paper.
5. Physical testing of paper.
6. Tarnishing and sizing tests.
7. Analysis of cotton linters.
8. Determination of alpha, beta, and gamma cellulose.
9. Reflectance and gloss measurements.
10. Spectrophotometric measurements for evaluation of color, color control, matching colors, determination of degree of fading.

Write for further information on paper testing and research and our special program of Product Quality Certification. Ask for price list of tests, too.



Chemical Division

UNITED STATES TESTING COMPANY, INC.
Established 1880
HOBOKEN, NEW JERSEY
PHILADELPHIA, PA. • BOSTON, MASS. • WOONSOCKET, R.I.
CHICAGO, ILL. • NEW YORK, N.Y. • LOS ANGELES, CAL.
Member of American Council of Commercial Laboratories

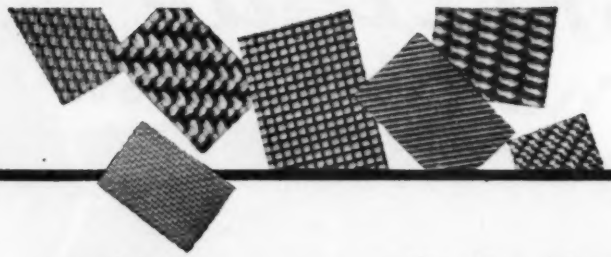
for the SPEED-UP that CHECKS handling costs

INSTALL

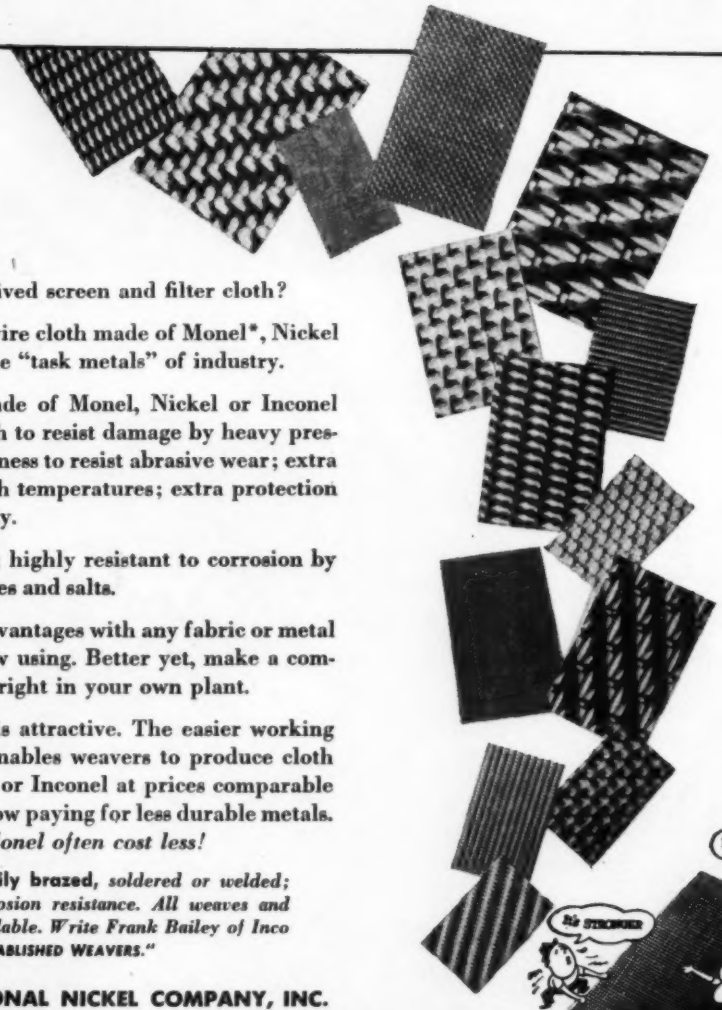
OWEN PULPWOOD GRAPPLES

The OWEN BUCKET Company
6019 BREAKWATER AVENUE • CLEVELAND, OHIO

BRANCHES:
New York, Philadelphia, Chicago, Berkeley, Calif.



When you call the job "tough" call for this *Screen* and *Filter Cloth*!



Tired of short-lived screen and filter cloth?

Then turn to wire cloth made of Monel*, Nickel or Inconel*... the "task metals" of industry.

Wire cloth made of Monel, Nickel or Inconel has extra strength to resist damage by heavy pressures; extra hardness to resist abrasive wear; extra endurance at high temperatures; extra protection for product purity.

It is rustproof; highly resistant to corrosion by most acids, alkalies and salts.

Compare its advantages with any fabric or metal cloth you are now using. Better yet, make a comparative-life test right in your own plant.

Even the cost is attractive. The easier working of these metals enables weavers to produce cloth of Monel, Nickel or Inconel at prices comparable to what you are now paying for less durable metals. *Fine weaves of Monel often cost less!*

Seams are easily brazed, *soldered or welded; retain full corrosion resistance. All weaves and meshes are available. Write Frank Bailey of Inco for booklet,* "ESTABLISHED WEAVERS."

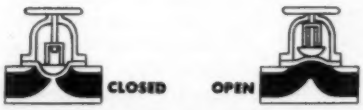
THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

*Reg. U. S. Pat. Off.

Monel ***Nickel*** ***Inconel****

"Task Metals" for Industry

Simple as pinching a rubber tube



A GRINNELL-SAUNDERS DIAPHRAGM VALVE works on a simple principle . . . it pinches tight for positive closure and opens wide for streamlined flow. The working parts of the valve are completely isolated from the fluid . . . no corrosion, no contamination and no leaks. Choice of diaphragm material. Body materials . . . cast iron, malleable iron, bronze, aluminum, stainless steel. Body linings . . . glass, lead, rubber or synthetics.

NO METAL-TO-METAL SEAT . . . The large contact area on which this flexible diaphragm seats gives positive closure even when grit, scale or other solid matter is temporarily trapped.

MINIMUM RESISTANCE TO FLOW . . . Smooth streamlined fluid passage without pockets prevents accumulation of sludge and reduces friction resistance to a minimum.

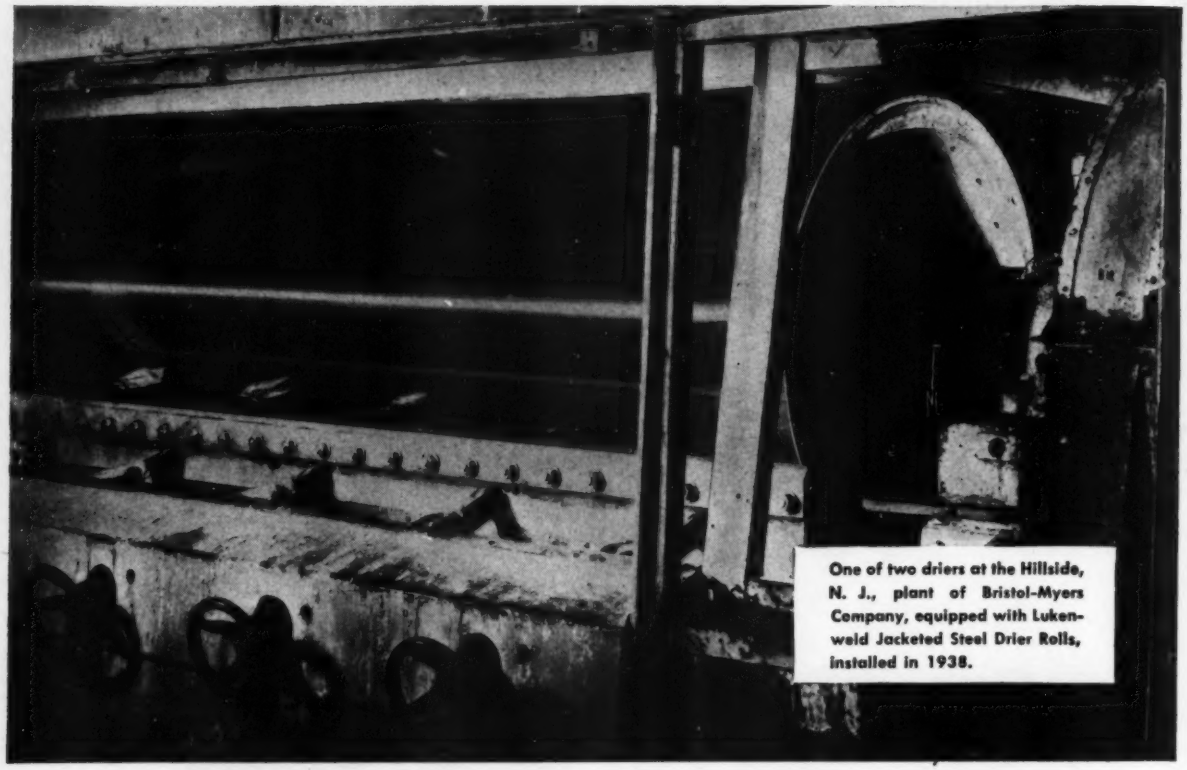
MAINTENANCE REDUCED . . . The diaphragm is the only part that normally wears out. Replaced in a few minutes without removing valve from line.

Available in various combinations of valve bodies and operating mechanisms.

59 YEARS PIPING

GRINNELL

Grinnell Company, Inc., Providence 1, Rhode Island. Branches: Atlanta • Buffalo • Charlotte • Chicago • Cleveland • Cranston • Fresno • Kansas City • Houston Long Beach • Los Angeles • Milwaukee • Minneapolis • New York • Oakland • Philadelphia • Sacramento • St. Louis • St. Paul • San Francisco • Seattle • Spokane



One of two driers at the Hillside, N. J., plant of Bristol-Myers Company, equipped with Lukenweld Jacketed Steel Drier Rolls, installed in 1938.

Bristol-Myers *Upped Production 41%* with Lukenweld Jacketed Drier Rolls

PATENTS APPLIED FOR

200 pounds of dried, flaked material every 7 to 8 minutes instead of the 10 to 11 minutes formerly required! That's how much Bristol-Myers stepped up output from these machines simply by replacing drum-type rolls of different material with Lukenweld Jacketed Steel Drier Rolls —an average increase of 41%.

No other changes were made. The increased production was entirely due to the increased drying rate and positive method of condensate removal of rolls of Lukenweld design and steel plate construction. Had steam pressure been increased above the 80 psi used in both old and new rolls, the drying rate could have been further increased.

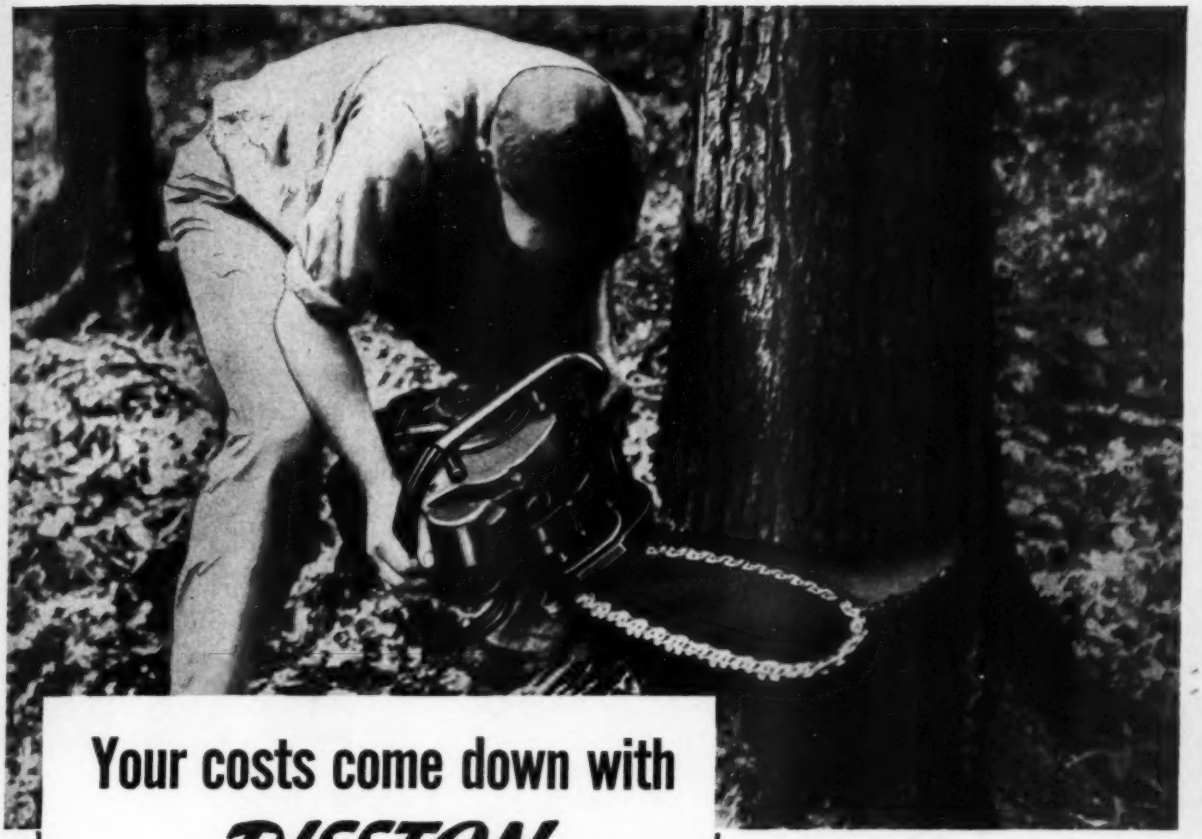
Reports from the Paper Industry show that Lukenweld Jacketed Steel Drier Rolls are similarly boosting production from existing machines, simply by installing them in place of old style rolls. New drier additions, designed and built by Lukenweld and employing Lukenweld Rolls, have further speeded up production while also maintaining high quality.

Bulletin 358 tells you about Lukenweld Jacketed Drier Rolls. For a copy, and for other drying help, write Lukenweld, Division of Lukens Steel Company, 408 Lukens Building, Coatesville, Pennsylvania.

We'll lend you "LUKENWELD", a 16mm motion picture with sound, highlighting our methods, facilities and products. Running time: 20 minutes. Write for booking date.

LUKENS
LUKENWELD DIVISION

LUKENWELD
DRIER ROLLS AND DRYING MACHINERY



Your costs come down with *DISSTON*

ONE-MAN CHAIN SAW

Powered by the Mercury Gasoline Engine

Make the modern move to the Disston One-Man Chain Saw. Watch production soar and costs come down. In mere minutes this saw does the felling, bucking and limbing that used to burn up costly hours.

The Disston One-Man Chain Saw is dependable—light to handle and husky—has long life, anti-friction bearings and positive lubrication. Easily started in any weather. Easily, safely controlled, even when cutting at awkward angles and upside down! Never has modern power taken such a big bite out of the cost of cutting timber and lumber. A demonstration proves it.

Get in touch with your nearest Disston Dealer.
Or write direct for full information.

NEW DISSTON ONE-MAN BOW SAW FOR ADDED USES

No more pinch, drag and strain in the cut. Available as a complete unit (Price $432)—or as an extra useful accessory (Price $55 including chain). Quickly interchangeable with Disston One-Man Guide Rails, anytime —anywhere.

ALSO...The best value for bigger timber . . . The DISSTON EXTRA-DUTY TWO-MAN CHAIN SAW

This 12 hp. husky does tough jobs double-quick. The right saw for heavy work. Pivoted blade swings 360°—for handy cutting at all angles.

MAIL COUPON TODAY

HENRY DISSTON & SONS, INC.
364 Tacony, Philadelphia 35, Pa.

Gentlemen: Please send me full information on the:

- ☐ DISSTON ONE-MAN CHAIN SAW
- ☐ DISSTON TWO-MAN CHAIN SAW

Name_____

Firm_____

St. & No._____

City_____ Zone____ State_____

HENRY DISSTON & SONS, INC.
364 Tacony, Philadelphia 35, Pa., U. S. A.
Canadian Factory:
2-20 Fraser Ave., Toronto 3, Ont.

WHEN YOU BUY A DISSTON PRODUCT YOU BUY DISSTON STEEL SKILL and SERVICE

SAVE MONEY and get BETTER PIPING by using the MIDWEST REDUCING ELBOW

Instead of a Standard Elbow and a Reducer

The Midwest Reducing Elbow saves more than a third of the welding when used instead of a standard elbow and reducer. In addition to a substantial saving in time and money, it provides much neater appearance and insulation is easier. The gradual reduction, smooth curve and absence of abrupt neck reduce the pressure drop and turbulence. Center-to-end dimensions are the same as for ASA standard elbows.

All the advantages of Midwest Standard Elbows are to be found in Midwest Reducing Elbows . . . unusual dimensional accuracy and uniformity, stress relieving, beneficial effect of working metal in compression, etc.

The Midwest Reducing Elbow is only one of many fittings developed by Midwest to reduce the cost and improve the quality of welded piping. You will find it advantageous to get in touch with the Midwest Distributor near you whenever you need welding fittings.

MIDWEST WELDING FITTINGS
Improve Piping Designs and Reduce Costs

90° ELBOWS

REDUCING 90° ELBOWS
45° ELBOWS

LAP-JOINT STUB ENDS
REDUCERS

CAPS
SADDLES
SLEEVES

RETURN BENDS
TEES

LATERALS
CROSSES
REDUCING-ON-RUN TEES

SHAPED NIPPLES
FLANGES

MIDWEST PIPING & SUPPLY COMPANY, Inc.

These big, modern stacks were manufactured by Farrel-Birmingham Company, Inc., Ansonia, Connecticut, for use in conjunction with a new paper machine built by the Black-Clawson Company, Hamilton, Ohio, for Florida Pulp and Paper Company, Pensacola, Florida.

Sixteen DIT Type Timken bearings are used on the roll necks of each stack. They are disposed as follows:

- 2 bearings on 20" top roll.
- 2 bearings on each of 5, 15" intermediate rolls.
- 2 bearings on 20" next-to-bottom roll.
- 2 bearings on 32" bottom roll.

The following important advantages accrue from the application of Timken tapered roller bearings on the calender rolls:

1. Friction is eliminated, rolls turn smoother and easier. Power consumption is reduced. Lubrication is simplified and economized. Calenders can be restarted after stoppage without raising the weights.
2. Because of the line contact of Timken bearings, their ability to carry radial, thrust and combined loads, their stubborn resistance to wear and their fine precision manufacture, calender rolls are held rigidly in alignment under all operating conditions.

Make sure you have these advantages in your calenders; specify Timken bearing equipped. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "TIMROSCO".

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

The pay-off IS CERTAIN . . .

It sometimes happens that a horse that gets off to a slow start does pass the field and come in first at the stretch. This can never happen with a sheet of paper or board.

The speed at the press rolls must be the same as the speed at the drier rolls—and it must be fast! Hamilton Felts assure that it will be fast.

Hamilton Felts remove more water at the wet end of the machine in less time. They deliver less water to be evaporated at the drier rolls. The pay-off is a matter of record in the felt books of the leading mills of America.

• *From the thinnest tissue to the heaviest board, there is a Hamilton Felt that will do your work better, faster and at lower cost.*

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

NOW . . . the final answer for calender service . . . .

There never has been anything to equal the Johnson Joint for getting steam in, and condensate out of, paper machines, corrugators and calenders. Its unmatched ability to save time, trouble and money has won it a recognized place in the paper industry.

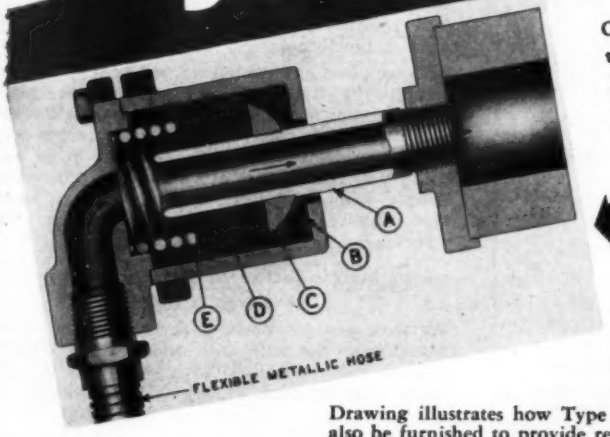
Now Johnson forges still further ahead—with the new Type S Joint. Retained are the basic virtues of the Johnson Rotary Pressure Joint; it is completely packless, self-lubricating, self-adjusting. To these the Type S adds now the final complete answer for service on calenders where excessive lateral movement is encountered, or where suitable supports cannot be readily provided.

The Type S Johnson Joint needs no external supports; it is completely self-supporting—shifts as the roll shifts—ends the danger of life shortening wear and loss of efficiency that rides along with lateral misalignment.

Write for catalog today.
Get all the facts on the New Type S for your plant.

The new self-supporting Type S Johnson Joint is big news for the tough service encountered on calenders. It shifts with the roll—ends threat of misalignment altogether. In this installation steam enters through another Johnson Joint at opposite end of top roll, and condensate is removed through another at opposite end of lower roll.

THE NEW TYPE-S JOHNSON ROTARY PRESSURE JOINTS



Cross-section view shows the simple design and the trouble-free construction of the Type S Johnson Joint. Nipple (A) is attached to roll or cylinder, has convex hemispherical collar (C) which rotates against matching surface of special carbon graphite seal ring (B). Guide (D) is also of long-lived, self-lubricating carbon graphite, is fitted carefully into the body. Spring (E) is for initial seating; pressure within the Joint is the actual sealing force.

Drawing illustrates how Type S can also be furnished to provide removal of condensate by syphon pipe through the same head that admits the steam. Note flexible hose connections.

Product of The Johnson Corporation

845 Wood Street, Three Rivers, Michigan

Rotary Pressure Joints • Compressed Air Separators and Aftercoolers
Direct Operated Solenoid Valves • "Instant" Steam Water Heaters

Shown here is one view in the spotless modern plant where Swift's Animal Protein Colloid is made. Operation is continuous, automatic . . . the product is "untouched by human hands," not contaminated by foreign substances.

Investigate this Modern Process Agent:

Swift's Animal Protein Colloid*

(made from an exclusive Swift Process)

Does your manufacturing process require . . .

1. An emulsifier?
2. A flotation agent?
3. A gel structure?
4. A settling agent?
5. A protective coating?
6. A sizing agent?
7. A carrier of pigments?
8. An impregnating agent?
9. A base for pigment?
10. An oilproofing agent?
11. A flocculating agent?
12. A clarifying agent?
13. A filtering agent?
14. A stiffening agent?
15. A mordant?

This modern process agent, Swift's refined Animal Protein Colloid, has properties which may be employed in a wide number of processes. Even though you have used other processing agents, be sure you investigate Swift's Animal Protein Colloid now. It has unusual properties. It may meet the requirements of your present operations or help in developing new ones.

Commercially high quality bone glue.

What is this modern process agent?

Swift's Animal Protein Colloid is made by an exclusive Swift process. Protein liquor is extracted from bones and highly concentrated. This pure liquid falls on a bed of dry finished product which adheres evenly to the droplets. Then, by continuous and automatic schedule, these droplets travel through driers and are milled and screened. This whole operation is under *precise synchronized control* and is completed in relatively short time.

The result is a uniform granular form that goes into solution rapidly. It's a purified product, light amber in color.

Because plant and machinery are kept spotlessly clean — the finished product does not touch material which can contaminate it with foreign substances . . . because of the precise control possible with Swift's exclusive process, Swift can bring you this *superior* processing agent. And Swift's Animal Protein Colloid has the same high quality and uniform characteristics the year 'round.

Swift's technical service yours, investigate now

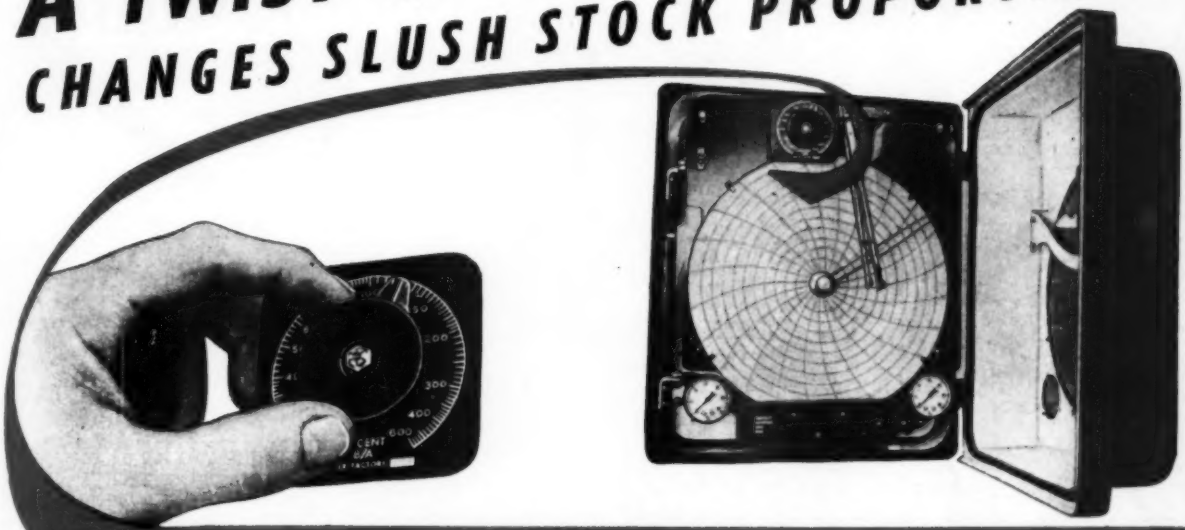
Write or phone for one of Swift's special representatives. He will call and discuss Swift's Animal Protein Colloid with you. This process agent may be just what you are looking for. Write to:

Swift & Company

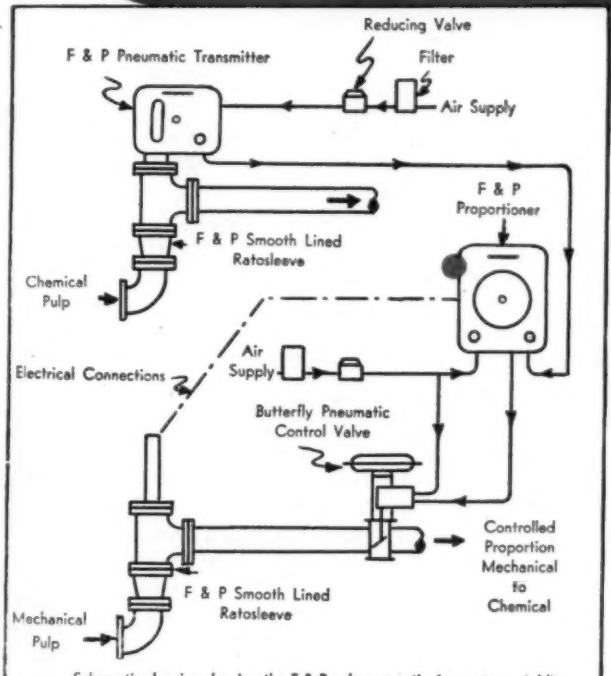
ADHESIVE PRODUCTS DEPARTMENT

4123 Packers Avenue, Chicago 9, Illinois

A TWIST OF THE WRIST
CHANGES SLUSH STOCK PROPORTIONS



THE NEW F & P PULP PROPORTIONING SYSTEM



Schematic drawing showing the F & P pulp proportioning system. Additional FLOWRATOR instruments are used when fluids such as broke, alum, and color are tied into the main line.

- ***Eliminates Head Boxes***
- ***Eliminates Pulp Return Lines***
- ***Provides "Basis Weight" Control***
- ***Saves Floor Space***
- ***Records and Totalizes Pulp Flow***

● Yes and more! The new F & P slush stock proportioning system . . . based upon the modern science of instrumentation . . . is rapidly replacing cumbersome and bulky compartment type feeders.

F & P INTEGRATED control systems start at the paper machine and, from the measurement of its speed, control pulp flow rate. Stock chest level . . . chemical to mechanical pulp ratio . . . size . . . color and filler flow rates are all "tuned" to exact proportion by a simple-

TWIST OF THE WRIST.

Write for technical bulletin "New Developments in Pulp and Paper Mill Instrumentation."

FISCHER & PORTER CO.
Dept. 9N-1F, Hatboro, Pa.

FLOWRATOR
TRADE MARK

INSTRUMENTS FOR FLOW RATE MEASUREMENT AND AUTOMATIC FLOW CONTROL

For a holiday that's really unusual, visit this unique resort blessed with an invigorating, health-building climate. Near Las Vegas is gigantic Hoover Dam, an unforgettable spectacle . . . also amazing Death Valley, a delightful oasis in colorful desert land surroundings.

Stop at Las Vegas en route to or from Los Angeles. There's a variety of Streamliner and other fine service from Chicago, St. Louis and Kansas City. You'll enjoy a restful ride over Union Pacific's smooth roadbed, plus excellent meals and service.

Write Union Pacific Railroad, Omaha 2, Nebraska, for information regarding Las Vegas.

UNION PACIFIC RAILROAD

Road of the Streamliners

Savings Will Be Felt...
when you use Woodberry 887 Dryer Felts

Paper mills don't take long to discover the economies in Woodberry 887 dryer felts....

There are hours and hours of extra wear in Woodberry's patented feature — asbestos yarns woven at scientifically determined intervals into the face of these heavy duty felts. And check the savings in lowered steam consumption that results from Woodberry's high degree of porosity.

For durable reinforced dryer felts—with highly uniform contact surfaces that mean finer qualities of paper—specify Woodberry 887.

uniformity makes the big difference

TURNER HALSEY
COMPANY
Selling Agents
40 WORTH ST. • NEW YORK

Mt. Vernon-Woodberry Mills

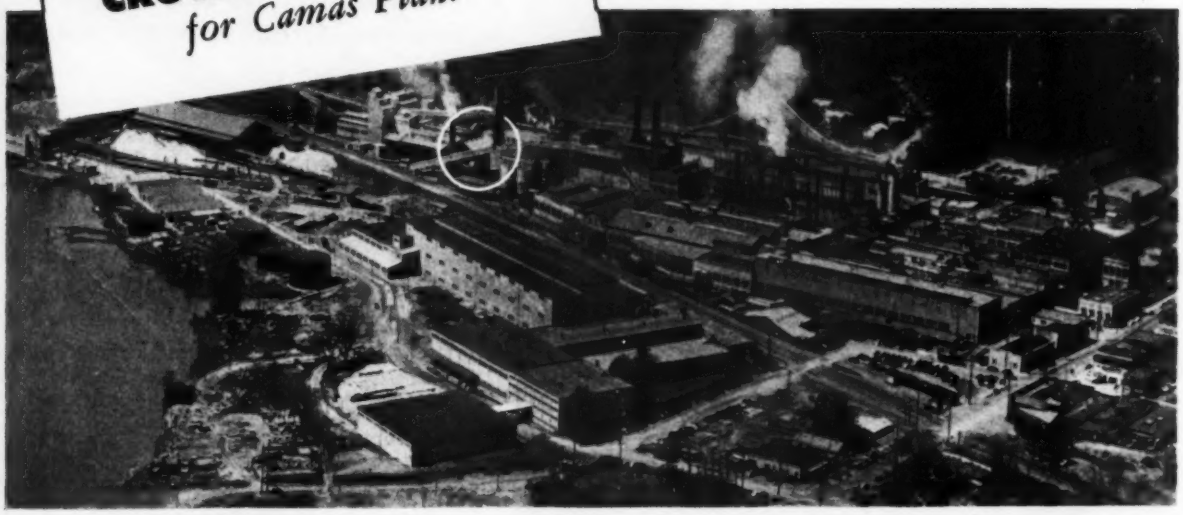
Branch Offices: CHICAGO • ATLANTA • BALTIMORE • BOSTON • LOS ANGELES • AKRON

Western Precipitation COTTRELL

again selected by

CROWN-ZELLERBACH

for Camas Plant



New Camas recovery unit one of many successful Western Precipitation paper installations...

WESTERN PRECIPITATION is the organization that—more than 30 years ago—pioneered the first successful application of COTTRELL equipment for collecting soda ash from the recovery furnaces in paper plant operations. And through the years Western Precipitation has continued its leadership in COTTRELL installations with one important development after another.

One of the latest Western Precipitation paper installations is the COTTRELL unit recently completed for Crown-Zellerbach for their kraft plant at Camas. This COTTRELL, recovering soda salts from the black liquor furnace gases, is only one of the Western Precipitation COTTRELL units chosen by Crown-Zellerbach for their paper mills.

In fact, at the Camas plant itself another Western Precipitation COTTRELL unit has been in successful operation for some 8 years, and the success of this installation was an important factor in the decision of Crown-Zellerbach to again install a Western Precipitation COTTRELL in the newly completed expansion to their Camas kraft mill operations.

Throughout the paper industry many other companies have also selected Western Precipitation COTTRELL equipment for their kraft mill recovery units, and the invaluable experience gained through the years by the Western Precipitation organization in this specialized field can be helpful to any paper plant contemplating installation of recovery equipment. Let our engineers study your particular requirements and make recommendations based on over 30 years of first-hand experience in the paper industry—more than 40 years in the design and construction of COTTRELL equipment for all types of industrial applications.

Send for descriptive literature on COTTRELL *equipment*

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1037 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 1 LaSALLE ST. BLDG., 1 N. La SALLE ST., CHICAGO 2 • HOBART BUILDING, SAN FRANCISCO 4, CALIFORNIA
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

HEAVY PLATE FABRICATORS FOR INDUSTRY

. . . that's Biggs

ESTABLISHED 1887

BIGGS MADE . . . 14-ft. diameter welded rotary digester

PRESSURE VESSELS TO MEET EVERY REQUIREMENT

The pulp and paper industries rely on equipment "built by Biggs". This is a logical outcome of our half-century of specialized experience in heavy plate assemblies, and our progressive research in fabricating with Nickel, Monel, Inconel, Stainless Steel, as well as all clad metals — to lengthen life of equipment and safeguard products.

Biggs' modern and complete plant facilities and long technical experience are yours to command or consult . . . Simply write, phone or wire the Akron Office. Our field representative will call to discuss your problem of fabrication for your requirements.

The Biggs Boiler Works Co. EST. 1887 Akron Ohio

WELDED PRODUCTS BY BIGGS TO CODE REQUIREMENTS

•

CARBON STEEL • SPECIAL STEEL SPECIAL ALLOYS and CLAD METALS

BBB-249-52

THE BIGGS BOILER WORKS COMPANY • 1015 Bank Street, Akron 5, Ohio

Trentweld

large diameter Stainless Steel

- - - for longer life and lower costs on stock and process lines

Maintenance costs come down when you use TRENTWELD large diameter stainless steel tubing . . . as many pulp and paper plants have found. The reasons are simple.

To the natural advantages of stainless steel for this severe service, TRENTWELD Tubing adds genuine *plus* values — *exclusive* forming, welding and sizing processes that reflect years of specialization in stainless steel, Inconel and Monel, the kind of skill that comes only from long experience in doing *one* thing *well*. Moreover, you gain from the broad background of Crucible Steel's contributions to corrosion resistance in a host of process industries that share this common problem.

Here is stainless tubing that will exceed your expectations — tubing that will be in service long after process lines of ordinary material have been replaced. Plan now to try TRENTWELD on your toughest line. And remember —Trent engineers are ready to assist you on any problem involving piping, tubing, welding, fitting, or fabrication of stainless materials.

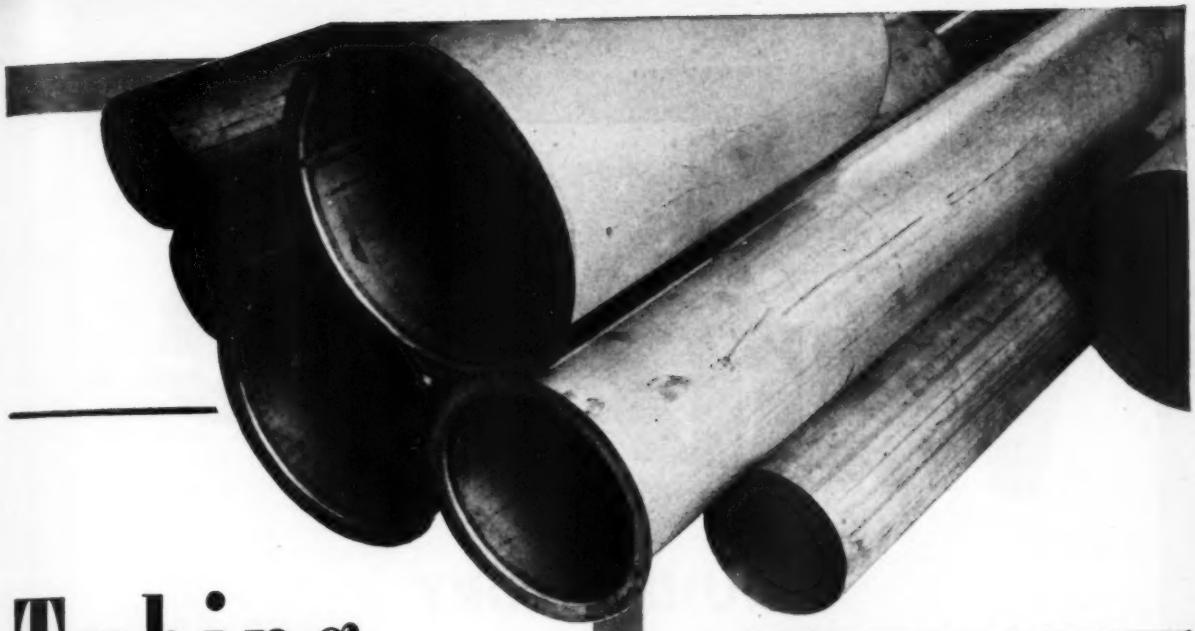
Call on Trent for your needs — as so many alert mill men are doing today. Meanwhile, have your received your copy of the informative TRENTWELD Data Bulletin?

District Offices — New York, Chicago

TRENT TUBE COMPANY

Subsidiary of CRUCIBLE STEEL COMPANY OF AMERICA

440 Church Street, East Troy, Wisconsin



Tubing

Plus Values

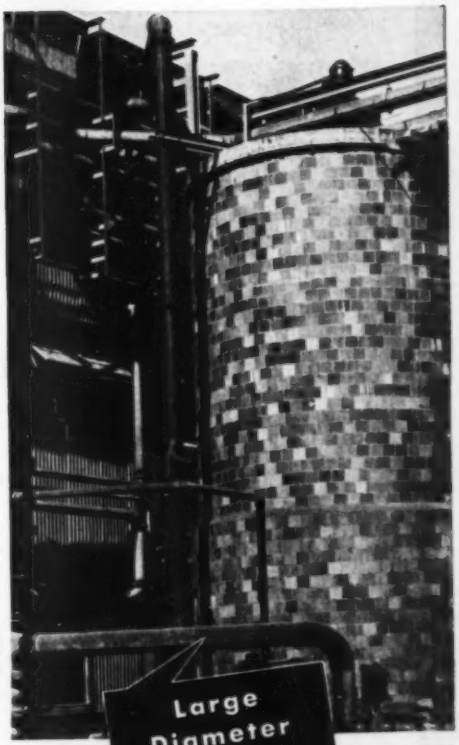
that make Trentweld different

1. Machine-welded and machine-sized for accuracy in sizes up to 30 inches.

2. Free from carbide precipitation and foreign contamination.

3. Designed for either welded or breakdown fittings.

4. Flat-round welds, with no metal added.



Large Diameter Tubes

Vanstoned Fittings

Vanzyme

LIQUID or DRY

STARCH CONVERTER

for

TUB SIZING
CALENDER SIZING
MACHINE COATING
LAMINATING ADHESIVES

R. T. VANDERBILT CO., Inc.

230 Park Avenue, New York 17, N. Y.

THE PAPER INDUSTRY
and PAPER WORLD
MARCH 1949

Editorial

Paper and People

▸▸▸ HOW LONG will it be until every man, woman and child in this country will consume a pound of paper per day? We came close to it last year. We won't make it this year, though, because of two major factors: (1) the rate of population growth is still rising, and (2) the rate of increase of paper production has leveled off. Since the number of consumers is increasing faster than the paper industry is increasing its production capacity, it stands to reason that per capita consumption will have to decline. But this doesn't mean total consumption will decline. Not according to D. C. Everest, who in his recent address before the Sulphite Paper Manufacturers Association analyzed the growth and stability factors of the paper industry based on his now well-known paper consumption chart (see THE PAPER INDUSTRY AND PAPER WORLD, page 1450, January, 1949).

Foremost among the factors that have contributed to the phenomenal increase in use of paper and paperboard during the past few years, according to Mr. Everest, is the fact that paper has no economical substitute. For instance, there is still no other satisfactory material for wrapping and packaging that affords the same protection which is comparable in cost. Similarly, there is no material available that can be printed as satisfactorily at so low a cost per square foot. New grades of paper and paperboard, together with new uses for both new and old grades, have been developed. Actually, paper has become a substitute for many other materials that were scarce during the war. One of the basic reasons for this industrial growth has been the research and development that have gone into improving production and reducing costs.

An increased number of consumers, however, is the key to growing consumption. Even though per capita consumption ceases to grow, the over-all consumption of paper products will increase for the simple reason that there are more people. Since consumption of its products is the key to stability of any industry, Mr. Everest looked into the consumption trends for 1949. To do this he went to what he considered some of the best informed people in each of several consuming industries. Some of the comments he received bear out his belief that the paper industry has little cause to worry about business in the year to come.

Consumption of newsprint and publication papers has grown tremendously. In 1948, for the eighth consecutive year, daily and Sunday newspaper circulation in the U.S. reached a new high. Increase in newsprint consumption has been estimated at six per cent on a tonnage basis over 1947. Just because one can buy a little spot tonnage of newsprint now at something less than the black market prices effective early last year, doesn't mean that the newsprint industry is starting to slip. Since newsprint consumption depends on advertising lineage, it is reasonable to believe that there will be more square feet of newsprint employed in advertising, as a more highly competitive situation exists in all industry. Too, if volume of advertising has some relation to corporate income tax rates imposed by Congress, there is further reason to believe that advertising will continue to be used widely. Comments from book and magazine publishers indicate little tendency for lower usage for the coming year.

In the use of sanitary papers, there is every indication of greater demand. Most items in this class have been scarce at various times during the past few years. Constantly increasing population and a high rate of employment should insure an increasing need for these products. Practically all paper products that are used by the consumer, such as paper cups, drinking straws, and food packaging papers, are pretty well geared to population. It doesn't seem likely that demand for this type of products can decrease appreciably.

One of the most important classes of production is paperboard. While consumption of paperboard has almost doubled from 1939 to 1948, this branch of the industry has, in the opinion of Mr. Everest, greater opportunity for furthering its consumption than most other branches of the paper industry. Despite the fact that so far this year consumption of paperboard has been less than the corresponding period of last year, the total consumption for 1949 probably will run several per cent higher than for 1948.

Against this increased demand are factors that make it physically impossible to produce as much paper in 1949 as in 1948. These are the amount of tonnage taken out due to replacement and modernization programs and the number of marginal mills which for one reason or another may be shut down. To offset this, we have some new capacity coming into operation, together with increased production, because of rehabilitation and modernization of old mills.

Mr. Everest emphasized that his whole approach was from the standpoint of pounds of paper and people, not dollar income and profits. On this basis he believes that 1949 consumption will equal or exceed that of 1948.

There are many who do not share Mr. Everest's optimism. However, the February report of W. L. Neubrech, Chief of Forest Products Division, Pulp and Paper Section, Department of Commerce, sums up the situation for 1948 and 1949 to reach a similar conclusion.

We quote . . . "The trend during 1948 may be said to have been: A continuous upward trend in production by integrated mills; a slackening in production by many non-integrated mills; closing down or a shift to other classes of paper by several marginal paper and board mills of the non-integrated group, a leveling-off in the demand for nearly all grades of paper and paperboard; emergence of a keenly competitive market; and a return to prewar standards of quality. As the paper industry enters 1949, the outlook is definitely favorable for a sustained level of production. In general, most manufacturers and distributors foresee a steady market for their products assuming there is no substantial diminution in the level of over-all economic activity. There is, however, evidence of normal peacetime competition in terms of quality, prices, service, and related factors which go to make a healthy state of American business enterprise."

Aerial view of St. Regis Paper Company facilities at Tacoma, Wash. The new kraft paper mill is seen in the foreground. In the background, at the left, is the barking plant; in the center is the sulphate pulp mill

A New Kraft Mill

. . . . . has become a vital link in the diversified operations attained by St. Regis Paper Company since it was brought into being half a century ago.

The company was incorporated at Deferiet, New York, in 1899, and several years later commenced operations with one newsprint machine. Today, the company's far-flung operations extend to eighteen states and many foreign countries.

When the original mill commenced operations just after the turn of the century, its employees numbered 200. Today, the employees total more than 13,000.

A leading producer of lightweight printing and publication papers, the company also is a dominant factor in the multiwall paper bag field; a leading manufacturer of automatic bag filling equipment; a large producer of kraft paper, and an important manufacturer of laminated plastics through its Panelyte Division.

During the years, St. Regis has taken steps to assure sufficient raw materials with which to keep its facilities operating. The timber holdings of the company total about 1,800,000 acres in the Northwest, Northeast, and along the East Coast into the South.

TRADE WINDS

St. Regis Now Has Integrated Operations on the Pacific Coast

▸▸▸ MANY MODERN FEATURES in mill design and operations have been incorporated in the new kraft paper mill of St. Regis Paper Company, Tacoma, Washington. This new mill, which went into production last month, has functioned smoothly since it was started. The paper machine is designed to produce multiwall kraft paper 180 inches wide at a rate of 2,000 fpm, the equivalent of 240 tons daily. The mill is supplemented by a modern barking plant that the company placed in operation just a few months ago.

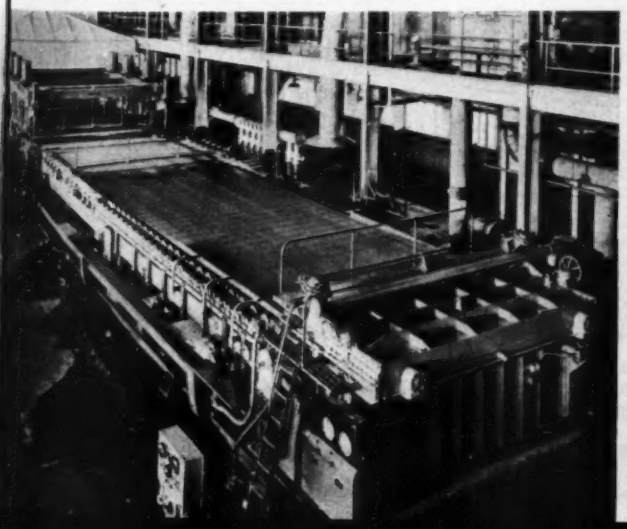
Part of the pulp manufactured by St. Regis at its 300-ton Tacoma sulphate pulp mill now is converted into paper at the adjacent paper mill, and then into multiwall paper bags at the company's three western plants, to meet the mounting industrial packaging needs of the Pacific Coast. The bag plants are located at Seattle, Los Angeles, and Emeryville (soon to be replaced by a new bag plant at San Leandro, California). The balance of the pulp continues to be available for the company's pulp customers.

To round out the integration and to assure its new facilities of sufficient raw materials, St. Regis has acquired in recent years substantial timber resources in the Pacific northwest.

In announcing initial operations of the company's eighth kraft mill, construction of which started in December, 1947, St. Regis chairman and president, Roy K. Ferguson, said the location offered an exceptional combination of geographical and industrial advantages making the integration possible. He added that the current phase of the St. Regis program of integration, modernization and expansion had virtually been completed.

The Tacoma kraft paper mill is housed in a semi-detached new building 612 feet long. Construction up to the machine room floor is of reinforced concrete, and above this of steel with welded trusses enclosed in Robertson

LEFT—West end of the Pusey & Jones paper machine in the new kraft paper mill of St. Regis company, Tacoma. Stock reaches the 120-ft. wire through a flow spreader and pressure inlet (right) eliminating the conventional headbox . . . RIGHT—Kraft paper passes through 76 paper and 14 felt dryers and the calender stack, and is rolled onto Pusey & Jones winders. The machine is designed to run at rate of 2,000 fpm



steel panel corrugated siding. The siding consists of a flat inner surface separated from the corrugated outer surface by two inches of glass wool. Corrugated glass with stainless steel fittings is used for continuous windows the full length of the building at two levels.

Several stages of refining, through 10 Jones Majestic jordans in various combinations, make use of a total 125 tons of tile lined chest capacity. The jordans are equipped with inkless recording wattmeters and are inter-connected by a piping system fitted with 45 DeZurik two and three way valves. Piping throughout the mill is Johns Manville Transite with fabricated steel flanges which do not come in contact with the stock at straight connections, stainless steel elbows or tees. A color code, employing a dozen colors, designates all pipes and conduit, depending on the piping function such as for stock, water, air, or 440 and 4,100 volt d-c.

The Pusey & Jones paper machine is equipped with a 180-inch by 120 foot wire, with a 44-inch diameter Downingtown suction couch containing two boxes 12 inches and seven inches wide. There are two 36-inch rubber-covered suction presses also manufactured by Downingtown. Following is a smoothing and creping press and a dryer section, divided into four parts, containing 76 paper and 14 felt dryers. The calender stacks, a drum reel and a Pusey and Jones winder complete the machine setup.

Designed to operate up to 2,000 fpm, the machine is driven by General Electric direct current motors capable of developing 2,800 hp. The motor generator sets, and controls for the drive, are housed in a 180 by 20 foot air conditioned control room maintained at a slight air pressure to repel dust and lint from the delicate instruments. The conditioning system for the room, like all other air and moisture removal systems in the mill, was designed and installed by the Drew Engineering Company, of Portland, Oregon.

Even a casual trip through the new mill reveals many innovations, such as: The Hercules Powder Company's automatic and continuous emulsifying system for size, one of the first in the country and the only one so far installed in the West. The Pusey & Jones flow spreader and pressure inlet is the first in that part of the country. All mechanisms for handling the four-drinier, for wire changes, and the like, are driven by hydraulic motors, as are the press and dryer doctor oscillators. The 30,000 gpm fan pump maintains a constant pressure in the flow spreader inlet through a magnetic clutch controlled from the machine tender's main panel. All dry end broke is conveyed automatically into a Dilts Hydrapulper located under the machine. The Hydrapulper is controlled from a panel board near the calenders. It probably is the first application of the broke handling method for kraft, and the first for any kind of stock in the West.

The barking plant is virtually run by push buttons and hand levers, by an operator stationed in a glass cage commanding excellent visibility of all operations.

The plant, unique from the standpoint of efficient operations packed into a relatively small area, debarks seven kinds of logs, such as rafted, trunk and reclaimed logs, hydraulically or mechanically. From the barkers, logs move by conveyors to the chippers for reduction to chips in a matter of seconds.

Three barkers installed include two hydraulic barkers capable of handling logs sized 26 feet long, five feet in diameter, and four feet long, 14 inches in diameter, and a mechanical barker for smaller sized logs. Water pressure for the hydraulic runs about 1,400 pounds.

Five chippers ranging in size from 72 inches to 153 inches and operating at upwards of 300 rpm reduce a given log of average size in 12 seconds.

Equipment within the barking facility is arranged for straight line operations, the logs moving through the various stages butt to butt.

Powerful electric motors drive the pumps and provide other power requirements.

MANDO Inaugurates Bleaching Operations

▶▶▶ OPENING OF a new bleach plant at International Falls with a rated daily capacity of 100 tons of bleached pulp was announced recently by Donald D. Davis, President of Minnesota and Ontario Paper Company. "Temporarily," said Mr. Davis, "bleaching operations will center chiefly on the processing of sulphite pulp."

"Inauguration of bleaching operations," he said, "will give us increased operational flexibility and is in line with our general improvement and modernization program directed toward constantly higher quality products."

"For the first time Mando will have the necessary facilities to produce bleached pulp, permitting the production of an expanded line of paper products, thus opening up new sales markets," added Mr. Davis.

This new bleach plant is of the most modern design, complete with all the latest equipment and control features, As many as six stages of treatment will be provided to produce the whiteness required in the production of high grade paper products. Under construction for two years, the Mando bleachery will eventually be equipped to process both sulphite and kraft pulp.

Centrally located in the mill proper, these new facilities are housed in three buildings. Two of the buildings, one for caustic storage and brown stock, the other for chemical preparation, supplement the 4-story main bleachery which measures 68 ft by 119 ft.

This modern plant features a system of push-button controls, centered on the top floor of the main Mando structure. Pumps and dump chests have been installed on the ground floor, seal boxes for the vacuum pulp washers on the second, with power units and substations, complete with metal clad control panels, housed on the third.

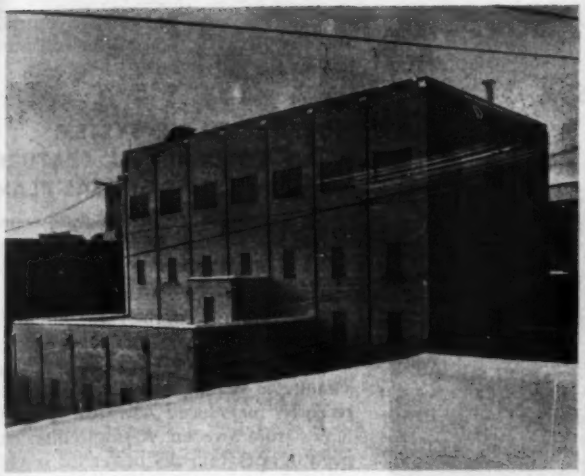
Especially designed doors effectively isolate the third floor which is under constant air pressure, a protective measure for employees and for the electrical equipment easily damaged by seepage of chlorine gas. A complete system of heating and ventilating has been installed here also, so that the outside air can be heated and filtered prior to being circulated.

Adam V. Rollak will supervise the operations in the bleachery.

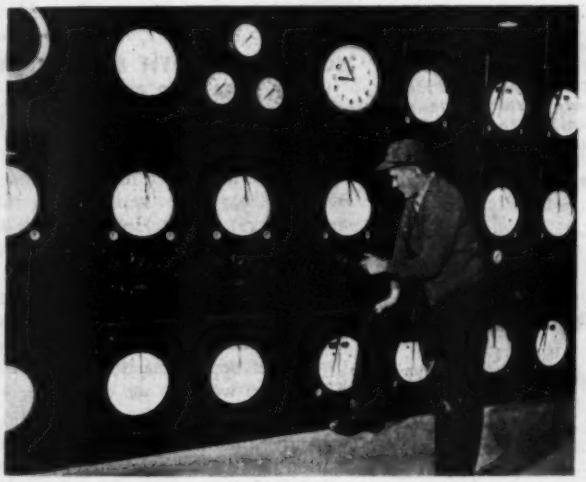
Start of bleachery operations will also mean the initiation of the first large scale use of the new Mando filtration plant, built to eliminate color and other impurities from water used in the bleaching process. Built for an immediate capacity of 15,000,000 gallons per day, this multi-storied water filtration plant can be expanded to process up to 30,000,000 gallons in a 24-hour period.

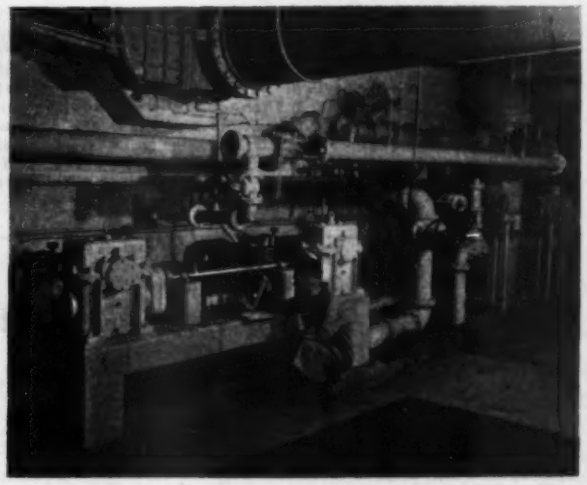
Three 350 hp pumps will supply the paper mill with an adequate supply of clean filtered water which will not only service the bleaching operations, but will be used elsewhere in the mill where required. Use of this filtered water in paper making processes will materially reduce the dirt count, Mando officials revealed.

Provisions have also been made to furnish filtered water to the city of International Falls, Minnesota.

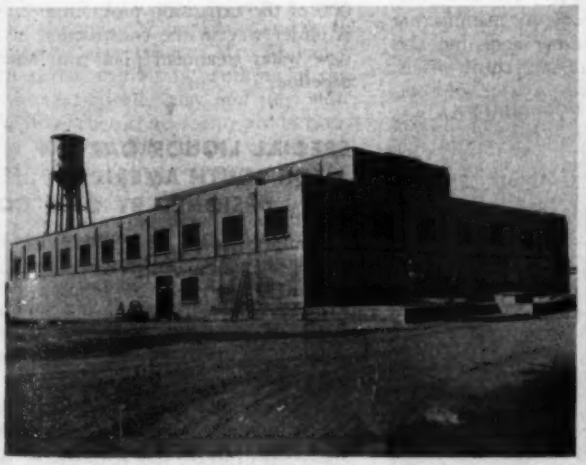


LEFT—Centrally located in the mill proper, the new Mando bleachery is of the most modern design . . . RIGHT—Stock is washed after each bleaching stage in a series of vacuum washers located on the top floor of the main bleach plant

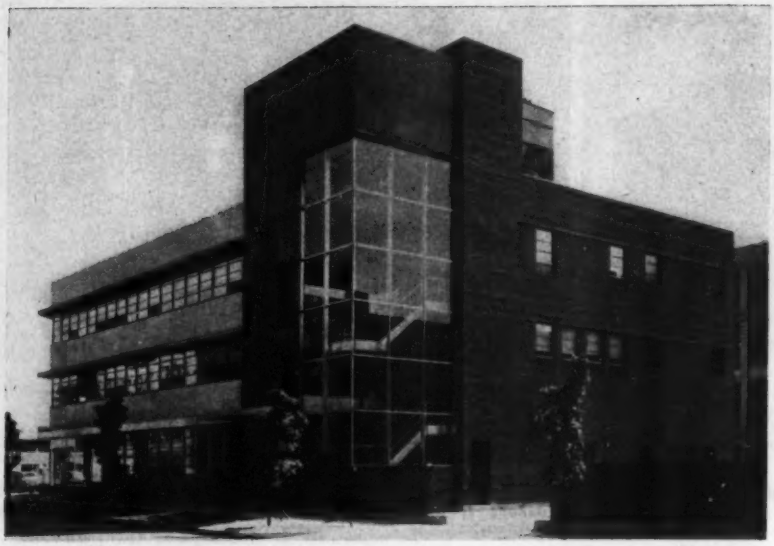




LEFT—The main instrument panel features centralized control—it undergoes a final checkup prior to the start of bleaching operations . . . RIGHT—Lab assistant W. E. Green checks the water at one of the control points set up in the filtration plant. The water is tested at various stages of the filtering process



LEFT—Pure water for bleaching is assured as Mando's 15,000,000-gallon water filtration plant commences operation with the opening of the bleachery . . . RIGHT—One of the final steps in removing impurities from the water is the passage of the water through a series of filter beds



***DAYLIGHTED STAIR WELL** of the Fort Wayne Corrugated Paper Co. building commands attention of residents and visitors at Fort Wayne, Ind. In contrast to the dimly lighted stair wells of the older buildings, this modern structure employs sparkling plate glass on corner sidewalls for three full stories, admitting an abundance of natural daylight and enhancing the architectural beauty of the structure. Libbey-Owens-Ford Thermopane, an insulating window unit made up of multiple panes of glass with dry air seal between, was specified for executive offices on the two upper floors. Other than being used to lessen heat losses, the insulating glass was specified as a soundproofing agency. The building has radiant heat and the two upper floors are air conditioned. Agate granite, stainless steel, and brick are used in exterior walls*

Newly-Organized Indiana Company Will Use Special Moulding Process

▶▶▶ AN ENTIRELY NEW industry to manufacture paper cups and other containers from raw pulp, using a new patented process whereby the product is produced and printed from raw pulp in one continuous operation, was announced February 26 at Marion, Indiana, by Lee Wiley, inventor and president of the newly-formed company, Form Moulding, Incorporated.

The new patented machine is approximately 70 ft. long and 10 ft. wide, weighing more than 32 tons. It has been erected at the new company's plant at 226 West Second St. in Marion. According to Mr. Wiley, it will be about three months before the finishing touches can be placed on the new machine to permit start of production. Work on the new process was begun in 1942, but was delayed because of the war.

The machine is designed to convert flat pulp sheets directly into the desired shapes. In action, the pulp sheet passes continuously through an impregnating tank of resin emulsion to render the finished container water repellent and resistant to heat and grease.

From this tank the sheet passes a blanking stage into the rough moulding unit, thence by conveyor through a drying oven into a finishing press. The finished moulds move directly into packaging cartons. Provisions also have been made in the machine for the containers to be printed while hot, between the finishing moulds and packaging carton.

Mr. Wiley said the new machine would eliminate many operations used in processes now in use. The new company plans not only to manufacture finished cups and other items but also to manufacture the machine itself. Whether the machine will be sold outright or on rental or royalty basis was not revealed at this time.

Most of the development work was carried on during the last several years at the Second St. address in Marion, on which a new lease was recently obtained. Besides delays caused by the war, other delays were occasioned by efforts to interest large capital, which finally has been consummated.

Associated with Mr. Wiley in the enterprise are Edward L. Moorehead, Marion electrical contractor; William C. Crimmins, president, Appliance Manufacturer, Van Buren, Ind.; D. D. Van Eseltine, Marion attorney; George G. Young, Pittsburgh investment firm, and Caspar S. Schneider, New York, representing the American Trustee Share Corp., New York investment house.

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MULTIPLE FILTER SYSTEM FROM SWEDEN WILL FEATURE SCOTT WASTE DISPOSAL PLAN

Construction of a $700,000 waste disposal plant will be started as soon as possible by the Scott Paper Company, Chester, Pennsylvania.

When completed, the plant will filter pulp fibers from approximately 4,750,000 gallons of waste water daily, using a multiple system of mechanical filters recently introduced into the United States from Sweden. A single filter has been in operation at Chester for several months on an experimental basis.

This plant at Chester will form a part of the state's stream improvement program.

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HOLLINGSWORTH & WHITNEY VOTE SUM FOR EXPANSION AT MOBILE (ALA.) MILL

A $13,300,000 expenditure for expansion of the paper mill at Mobile, Alabama, has been approved by the stockholders of the Hollingsworth & Whitney Company. This will mean a 50 per cent increase in pulp and paper manufacturing capacity, and a 100 per cent increase in bleaching facilities. The original cost of the plant, built in 1940, was approximately $6,000,000. About 750 workers are employed.

The company said it was preparing with investment banking firms for formation of a syndicate to underwrite an issue of $8,500,000 sinking fund debentures, maturing in 20 years, and marketing 61,510 shares out of 100,000 shares of common stock authorized in March, 1946. An estimated $2,800,000 of the expansion program already is under way in the construction of a new water treatment plant and water pipeline.

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SPECIAL LIQUOR CARTON FOR SOUTH AMERICA . . . ! DESIGNED BY GAIR CO.

For distribution in South American markets, Robert Gair Company, Inc., New York, has designed and produced a combination corrugated and folding carton to pack a line of liquors for Industrias Pampero C. A., of Caracas, Venezuela.

The exceptional brilliance of the "splash pattern" four-color printing on the carton was achieved by the use of "Gaircote" stock and a special design technique which requires no halftone or other screen printing.

Panelyte Division of St. Regis Will Expand into Kalamazoo

▶▶▶ THE PANELYTE Division of St. Regis Paper Company (now located in Trenton, N.J.) will expand its operations into Kalamazoo, Michigan, according to an announcement just released by Roy K. Ferguson, St. Regis president, from the company's offices in New York City.

New production facilities will be provided by acquisition of the Time Inc. paper coating mill in Kalamazoo. The taking over of this mill, built during the war, will represent a final stage in the arrangement made late in 1946 by which St. Regis acquired from Time Inc. the Bryant Paper Company in Kalamazoo, the Maine Seaboard Company, Bucksport, Maine, and the Hennepin Paper Company, Little Falls, Minnesota.

Under terms of the purchase agreement made at that time, St. Regis agreed to take over the coating mill not later than December 31, 1949. Negotiations now being conducted, it is indicated, may result in the plant being taken over some time before the end of the year.

C. Russell Mahaney, St. Regis vice president and Panelyte general manager, points out that Kalamazoo is admirably situated for the expansion of Panelyte's business. The strategic location of the plant widens the scope of Panelyte's ability to serve its customers. He added that with this new productive capacity, the company would be able to enlarge its production for existing markets, and enter into many new fields in which there are great potentials for laminated plastics.

This new and vital industry for the Kalamazoo area will require a substantial number of employees and there is every expectation, Mr. Mahaney states, that many now working in the Time coating mill may find jobs with Panelyte when it goes into production. The division will transfer certain executives and skilled personnel from the Trenton (N.J.) plant.

The Kalamazoo plant, according to Mr. Mahaney, will be approximately one-third the size of Panelyte's 50-acre Trenton facilities, where recent expenditures of more than $2,000,000 have resulted in greatly increased capacity.

The advent of the plastics division to Kalamazoo will further consolidate the industrial position which St. Regis Paper Company has taken in the community. The company's Printing, Publication and Converting Paper Division employs presently 850 persons in Kalamazoo in the manufacture of an impressive range of specialty papers for industrial uses and other purposes, and now is engaged in an enlarged program for the production of commercial printing papers sold through merchants.

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FEDERAL FLOOD CONTROL PROGRAM ASKED BY GROUP OF MASS. INDUSTRIALISTS

▶▶▶ Widespread damage caused by year-end floods in Berkshire County, Massachusetts, has prompted a number of industrialists in that area, including prominent paper manufacturers, to organize a body known as the Housatonic River Industrial Flood Control Group.

In the initial organizing group were: Byron Weston Company and Crane & Company, of Dalton; Smith Paper, Inc., and Hurlbut Paper Company, of Lee; Rising Paper Company, of Risingdale, and a number of textile mills also located along the Housatonic.

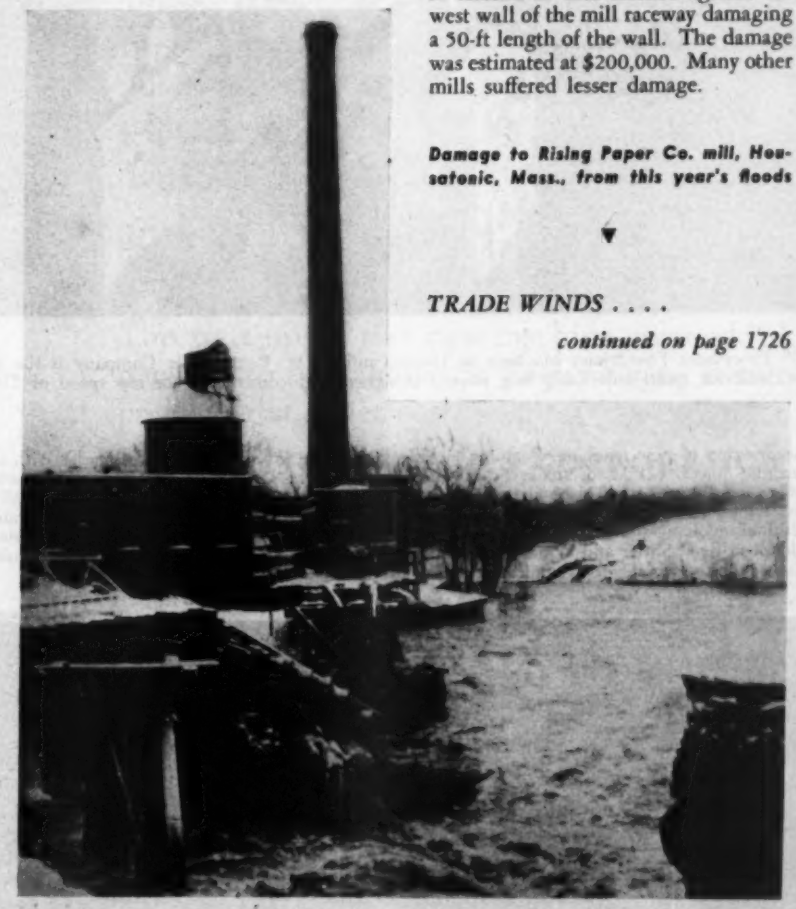
The executive committee comprises Fred E. May and W. E. Daverin, of Rising Paper Company; Arthur Crane, of Crane & Company; Charles Donahue, of Smith Paper, Inc.; and W. H. Flaherty, of the Great Barrington Manufacturing Company.

The group has two objectives: (1) to seek state aid in remedying flood damage to dams and other flood-curbing installations before the advent of the spring freshets, and (2) to work toward a federal program of flood control for the Housatonic River.

The group planned to meet with Gov. Paul A. Dever and state legislators and later to go to Washington for conference with U. S. Senators and Congressmen from that district.

It is understood that a similar group will be formed among industrialists along the Hoosac River, which is in Northern Berkshire County and which numbers among its riparian industries the L. L. Brown Paper Company and the Brightwater Paper Company.

A number of the mills in these areas suffered disastrous results from year-end floods. The heaviest damage was suffered by the Rising Paper Company, when after nearly two days of pounding by the flood a coal trestle at the rear of the mill collapsed on New Year's Day. A carload of coal crashed against the west wall of the mill raceway damaging a 50-ft length of the wall. The damage was estimated at $200,000. Many other mills suffered lesser damage.



Damage to Rising Paper Co. mill, Housatonic, Mass., from this year's floods

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TRADE WINDS . . . .

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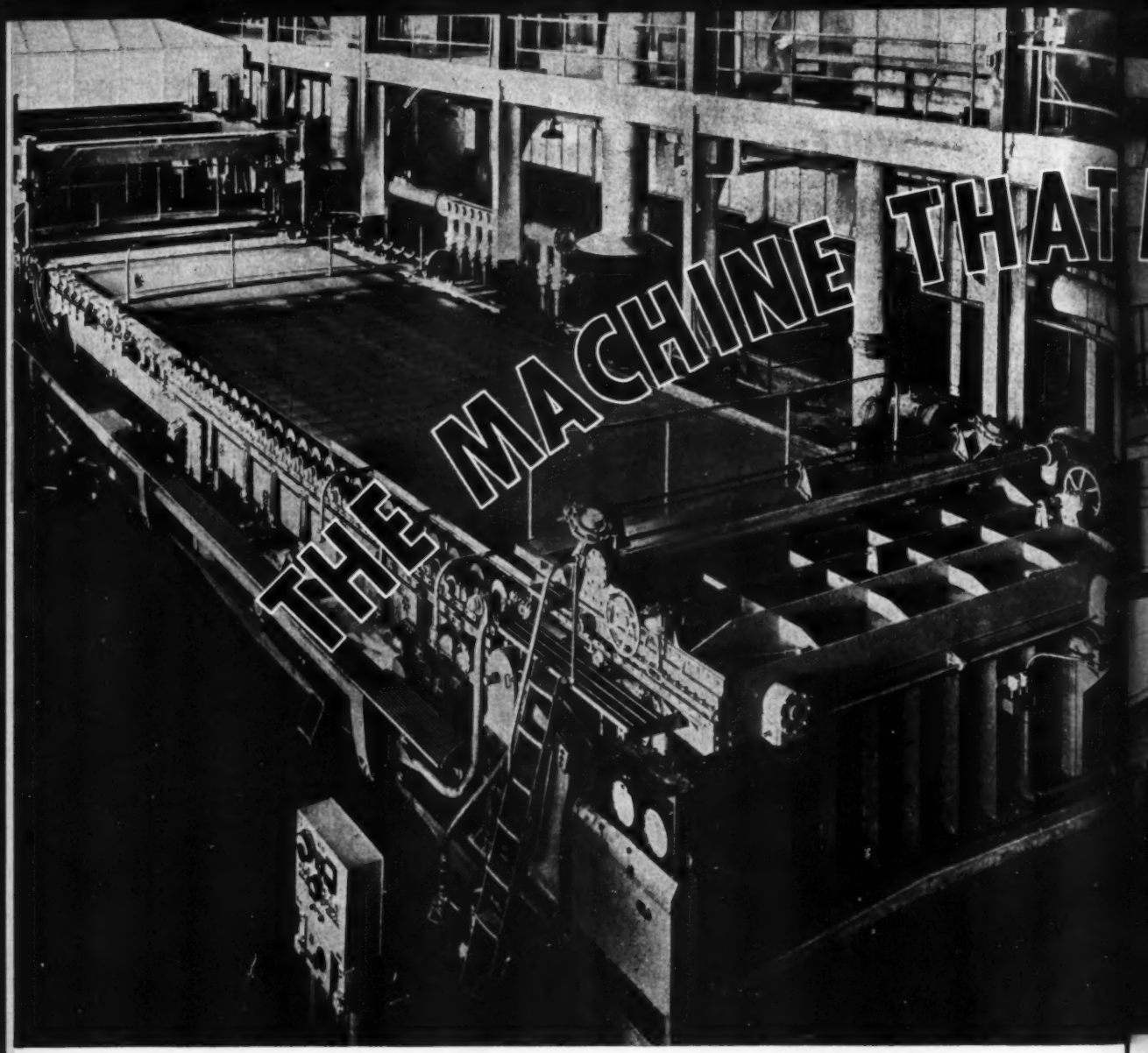
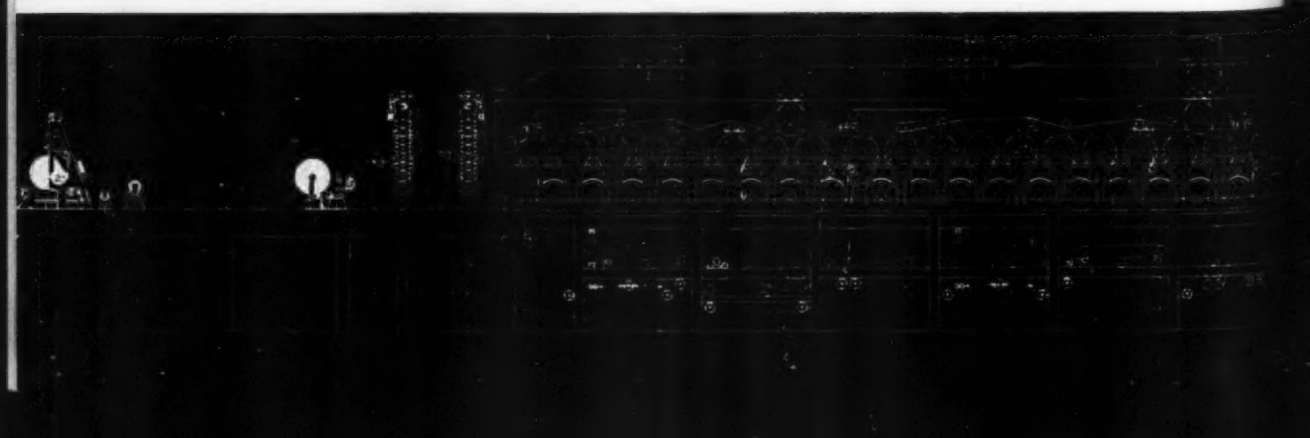


180" Puseyjones Fourdrinier Machine in Tacoma mill of St. Regis Paper Company is the highest speed, largest production machine ever built for multi-wall Kraft Bag Paper. Designed and constructed for top speed of 2100 F.P.M. Start-up was January 5, 1949.

Line drawing of new machine. Features include latest type Puseyjones Flow Spreader with entirely new closed pressure slice designed to handle 30,000 G.P.M. of stock; Fourdrinier part for wire 180" wide by 120 feet long with high speed shake, raising and lowering device, and "Rapi-drape" wire changer with all adjustments hydraulically operated, and all framework Monel covered; Press part of latest Simplex arrangement; special creping attachment; Dryer part arranged in four separate driven sections; latest type Steam Joints with dual revolving siphons; Dryer bearings with Lucite windows for observation; two Calender stacks with pneumatic loading; improved high-speed Reel; Slitter and Winder of latest two-drum type with roll-handling device hydraulically operated; all rotating parts including drying cylinders balanced dynamically for top driving speeds.



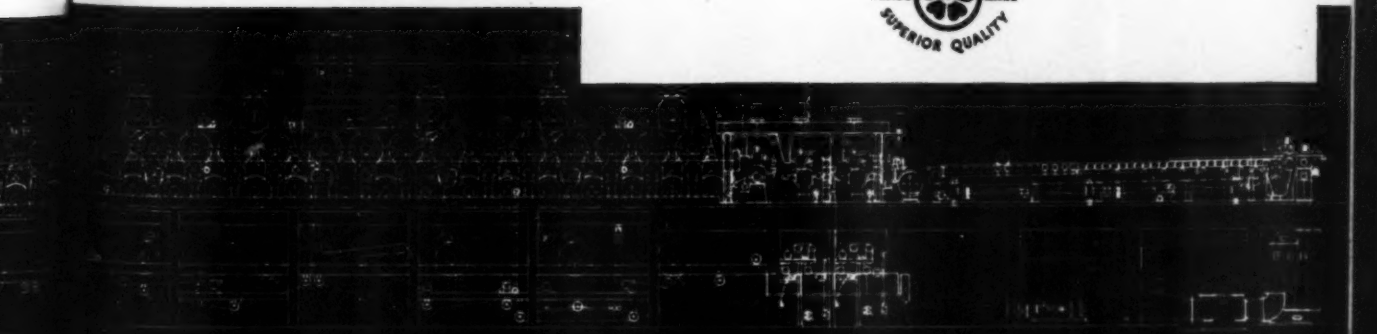
Here is the great new Puseyjones Fourdrinier Machine for high-test multi-wall Kraft Bag Paper now setting production records in the Tacoma mill of St. Regis Paper Company.

It's the machine that has everything—from the specially designed stock entrance unit to a slitter and winder designed for top winding speed of 4,400 feet per minute. Check the outstanding features detailed in the caption at left below.

The start-up of this new machine gives added meaning to the famous St. Regis slogan, "Better packaging at lower cost."

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY



New Developments in Straw Pulp Research

▶▶▶ PROCESSES considered revolutionary in making pulp from straw were announced during Paper Week by the U.S. Department of Agriculture's Research Administration. These new processes were presented at the annual meeting of the Technical Association of the Pulp and Paper Industry in New York City by government scientists of the Bureau's Northern Regional Research Laboratory, Peoria, Illinois, where the experiments were conducted.

(1) The Mechano-Chemical Process, presented before TAPPI by Drs. S. I. Aronovsky and E. C. Lathrop, of the Laboratory, will, it is stated, enable manufacturers of strawboard for boxes and packing materials—now the major industrial users of straw—to turn out a better product at a lower cost.

Adaptable for pulping various types of fibrous farm residues, this process depends largely on speeding up ordinary chemical pulping or digesting of the straw by rapid mechanical beating done in a specially designed open kettle. This mechanical-chemical action eliminates the need for cooking the straw under pressure and drastically reduces the cooking time required. With present methods used in strawboard mills, the straw must be cooked under 25 to 60 pounds pressure for 4 to 12 hours. Using the mechano-chemical process, cooking can be done at atmospheric pressure and is completed in one hour.

The Northern Regional Research Laboratory announced last year a process for making straw pulps that gave increased yields and a higher quality product at lower chemical costs than conventional processes (Cf. P. I. and P. W., March, 1948). This method, which involved the use of more effective digesting chemicals than had been employed previously, required cooking the straw under 100 pounds pressure for two hours. The Laboratory chemists recently found, however, that when the more effective chemicals were used along with mechanical stirring even larger yields of high quality pulp were obtained after cooking the straw at atmospheric pressure for only one-half hour.

Pilot plant studies made at the Laboratory show that the mechano-chemical process should lower substantially the cost of high-quality straw pulps, and the Bureau states that tests of the process in commercial operation will be undertaken soon. The necessary equipment requires a smaller capital investment than that previously used, takes up less space, and should need less labor, steam, and electric power.

(2) Another process that has been developed at the Northern Regional Laboratory is one that makes straw equal to wood for insulating board. The new method for making straw into building board was described before TAPPI by Drs. E. C. Lathrop and T. F. Naffziger, who have developed the process at the Laboratory.

Their procedure consists essentially of blending ordinary straw pulp with a new type of pulp which is relatively less expensive to produce and which contributes increased strength and other desirable qualities to the finished product.

Conventional straw pulp is normally cooked under pressure in a chemical solution. The new pulp is made by cooking the straw in water without chemicals at atmospheric pressure and then running it through a "disc re-

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MANUFACTURERS AND DISTRIBUTORS IN CANADA WATEROUS LTD., BRANTFORD, ONT.

THE CAPACITY OF the converting plant at the Sutherland Division of Sutherland Paper Co., Kalamazoo, Mich., will be practically doubled by this recently built and partly equipped plant which supplements the plant already in operation. The plant is equipped with Miehle horizontal presses and was first occupied during the latter part of 1948. Equipment of this plant will complete the Sutherland development at the Sutherland Division

finer," which breaks down the straw fibers into bundles of fine strands. The special properties of the new pulp are due largely to the fact that about half of its fibers are relatively narrow and slightly less than one inch long.

By blending these two pulps in varying proportions, manufacturers can produce insulating boards with a wide range of densities and other physical properties as desired. These improved strawboards have unusually high quality and greater strength at the same density than most commercial boards made from wood fiber. They also have exceptional resistance to sudden blows. This process requires no equipment new to board mills. The new straw boards can be formed on any of the standard board machines and dried either in tunnel or hydraulic-press dryers. The Laboratory's chemical engineers believe that with straw costing $14 per ton, delivered to the mills, the process will definitely place insulating boards from straw in a position to compete with those now made from wood.

▼

MODERNIZATION PLANNED FOR PAPER MACHINE AT DOWNINGTOWN PAPER CO.

Plans for the modernization of one of the paper machines of Downingtown Paper Company, Downingtown, Pennsylvania, were announced last month.

F. Huston McIlvain, president of the company, stated that contracts have been let for 72 welded steel dryers to Lukenweld, division of Lukens Steel Company. The 72 welded dryers will replace 92 cast iron dryers in the 120-inch board machine in the company's Plant No. 2.

The modernization program also will include replacement of slitter and calender gear reduction units and streamlining of facilities throughout the entire plant for more efficient, economical operation.

By eliminating 20 dryers, the company is making available much needed space for other equipment while maintaining over-all production capacity.

St. Regis takes
'EN MAJESTICS for TACOMA
with TAILORED TACKLE
FOR TOPS IN STOCK PREPARATION WITH
LOWEST POWER and MAINTENANCE COST

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MANUFACTURERS AND DISTRIBUTORS IN CANADA: WATEROUS LTD., BRANTFORD, ONT.

Nepco Modernizes Two Machines

With Complete New Fourdrinier Sections

▶▶▶ A MAJOR STEP in the Nekoosa-Edwards Paper Company modernization and expansion program was completed recently with the installation of complete new fourdrinier sections on Nos. 5 and 6 machines at the Port Edwards, Wisconsin, mill. A new roof over the two machines was completed a year ago together with extensive improvements in lighting and ventilation. These improvements along with the recent installations will insure even better quality fine papers from the two machines.

The two new fourdrinier installations include rubber-covered tube rolls, rust and corrosion resistant rails and white water trays and automatic wire tension control. In addition, improved doctors on the breast roll and the wire rolls are now in operation. Both machines are equipped with the latest type hoods on each dryer section. These hoods are connected to a Briner Economizer which transfers heat from paper machine vapors to the machine room heating system. Stainless steel trays receive excess water from the wire; the water is recirculated throughout the system. Because this cycle takes place at the rate of about 50,000 gallons of water per ton of paper, rust and corrosion resistant materials in the system carrying this amount of water are essential to the production of clean paper.

The automatic tension control and improved roll doctors serve to lengthen the running time or life of the fourdrinier wire by preventing slippage and by keeping the wire rolls free from stock accumulation. This feature not only results in economies in machine clothing and equipment, but also serves to cut down on the amount of down time resulting from premature wear of the wire.

The modern ventilating system in the Nos. 5 and 6 machine room is entirely automatic. Its operation assures uniform temperatures contributing toward more comfortable working conditions for paper machine personnel.

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BRITISH PAPER NOTES

(January, 1949)

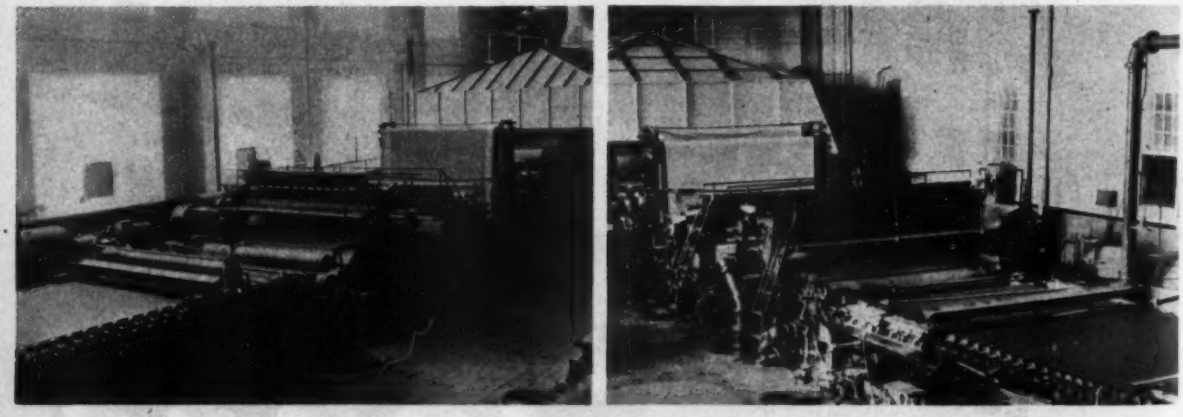
▶▶▶ As anticipated over the past several weeks, the first real effective stage in the decontrol of the British Paper Trade is about to be put into operation. From the beginning of the next licence period (March 6th), paper mills are to be granted an over-all bulk licence which will enable them to supply their output to any purchaser and in any amount. Although, as pointed out by the Paper Control, production of paper is still well below prewar rate, and consequently the makers are expected to exercise a little discretion in issuing these supplies. The Control is also careful to state that licensing is still in operation, and can be reimposed for all deliveries, if the necessity arises.

Certain papers are not included in the over-all bulk license, as, for example, newsprint, wallpaper, cable papers, and a few other grades not used in general printing. Also, restriction is still held on paper and board used for fiberboard packing cases and paper bags, and on the use of paper for advertising, and a few other purposes.

In effect, this new order means that the sale of paper, except for a few minor items, is now freer, and this has been brought about by the excellent increase in the imports of papermaking materials. The Board of Trade Returns, covering the whole of 1948, just published, discloses that materials were imported into this country at the rate of 76 per cent of prewar, which is a significant rise on the 46 per cent for 1947. Total imports for 1948 were 1,556,297 tons, an improvement of 400,000 tons on the previous year. Chemical, dry, bleached wood imports were actually higher than in prewar, reaching 272,280 tons, and the unbleached was 161,000 tons up on 1937 to a total of 465,186 tons. It is, however, in the mechanical pulp qualities, although appreciably higher than in 1947, where the heavy decline on prewar returns are shown. Esparto grass was also better than in 1947 and higher than prewar with 342,741 tons. Of these material imports Canada sent 47,000 tons more in 1948 than in 1947, Sweden 68,000 tons more, Norway 77,800 tons and Finland over 95,000 tons. Added to these material improvements the collection of waste paper in 1948 totalled 750,000 tons, over 105,000 tons above 1947.

This new licensing relaxation has produced a spate of inquiries. At the moment it seems that unless the papermakers are provided with extra materials to enable them to reach a higher rate of production in the next period, there will be a scramble for the paper produced. But in view of the healthy material situation, it is generally anticipated that the makers material quotas will be of a more generous nature than during past license periods.

The expected move in respect to newsprint production from 45 to 55 per cent of prewar has not materialized, but trade talks with Finland, Norway, and Sweden have produced promises of higher imports of both pulp and paper, the latter to include increased quantities of newsprint. From Sweden, it is

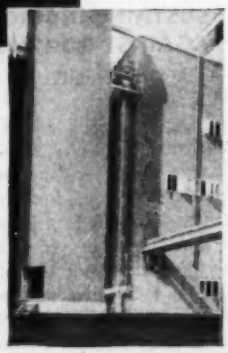


Two paper machines at Nekoosa-Edwards Paper Company's Port Edwards (Wis.) plant have been modernized. Both machines are now operating with complete new fourdrinier sections. Last year a new roof over the two machines was completed effecting lighting and ventilation improvements

LINK-BELT

Conveyors Handle Chips and Salt Cake for New Kraft Mill at Brown Company

Link-Belt horizontal and inclined belt conveyor carrying chips from storage building to kraft mill housing digestors.



L-B screw conveyor draws salt cake from bin, which is raised by L-B bucket elevator to top of building where a second L-B screw conveyor takes it to processing system.

Smooth, efficient handling which is a large factor in profitable operation, is exemplified at Brown Company's new Berlin, N. H. Kraft Mill, by the Link-Belt conveying machinery shown here. Wood chips are fed from bins to belt conveyors by Link-Belt rotary feeders, driven by Link-Belt Silverlink roller chain drives. Link-Belt troughing idlers with outer rolls at 45 degrees provide high carrying capacity. The 36 in. belt, at 400 ft. per min. carries 15,240 cu. feet of chips per hour.

The view above, showing hard wood chip bin, 15 feeders and belt conveyor, is duplicated for soft wood chips storage bin.

L-B screw conveyors and a bucket elevator, carry salt cake from storage to processing.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8.
Offices, Factory Branch Stores and Distributors in Principal Cities. 11,182

LINK-BELT

CONVEYING MACHINERY

NEW KRAFT BOARD MILL designed and completed in 1948 by The Rust Engineering Co., for Container Corporation of America at Fernandina, Florida. Portion to the left of water tank is for paper roll storage. Long section with company name on end of building is Paper Machine Room. Tall portion at extreme right of picture contains diffuser and stock preparation facilities. The one-story buildings at center right house locker room and personnel facilities. Note the five vision panels set in walls of the Paper Machine Room, purpose of which is not to admit light but to help employee morale by giving men a "change of focus." The mill has a capacity of 325 tons per day

anticipated that between 300,000 and 350,000 tons of chemical pulp will be received, and 150,000 tons of mechanical pulp.

Meanwhile production is steadily moving forward, and although at the moment stated to be only 75 per cent of prewar, exports in 1948 moved up to 137,358 tons, disclosing an advance of nearly 25,400 tons on the previous year. Of these exports, coated papers and boards still hold the lead in appreciation on prewar, at present standing at 184 per cent. Transparent cellulose reached the surprising total of 8,468 tons compared with the 1938 figure of 895 tons. Imports of paper and board in 1948 totalled 498,234 tons, just above 1947. Incidentally, it is noticed that the U.S.A. took 15,639 tons of paper and boards from Great Britain in 1948, compared with 2,016 tons in 1947, and 1,198 tons in 1938, and in return sent 29,596 tons, 4,600 tons more than in 1947.

For the first time since V.E. Day, news has been received of the installation of a new machine at one of the British mills. This is a 90 inch M.G. machine for making envelope paper, erected at the New Waterside Mill, Darwen, and on which it is hoped to reach an output of 120 tons a week.

In contrast to this piece of modern news, we have the celebration in the little Kentish village of Eynsford where the mill belonging to Messrs. Arnold and Foster Ltd., makers of handmade papers, has just reached its 300th anniversary. Dating back to 1649, this mill is one of the oldest in the country, and the craft of hand papermaking at this mill has been passed on from father to son for many generations. It was mentioned by one speaker at the celebration gathering, that among the rules of the original Society of Papermakers was one to the effect that "no apprentice could be taken unless his father and grandfather were in the Craft."

▼

Washington

APPA OPPOSES EXTENSION OF THE RECIPROCAL TRADE AGREEMENT

Robert E. Canfield, counsel for the American Paper and Pulp Association, has appeared before the Ways and Means Committee of the House of Representatives and the Finance Committee of the Senate in opposition to the Administration's proposal to extend the present Reciprocal Trade Agreement bill until 1951. Mr. Canfield's arguments before both groups was based on the legalistic side of the problem, without rehearsing the story of injury already sustained by the industry through past trade agreements.

Before both groups he said that the measure delegates dictatorial powers to the Administration in the fixing of tariff rates, and that while such power may be used benevolently, the fact that it exists is a constant danger to any industry which experiences foreign competition. The House has passed the bill, and it was then sent to the Senate for action.

▶▶▶ THE BATTLE OVER the repeal of the Taft-Hartley labor bill has been growing more heated, with every evidence that President Truman is not receiving the support he anticipated from members of his own party. As a result he has announced a speaking tour of the country to try to bring sentiment to bear on Congress. Meanwhile, labor unions, including those in the paper industry, are reported to be deferring all efforts to secure the writing of new wage contracts. Naturally, the unions do not disclose whether they are deferring action pending the possible repeal of the existing law, or whether they realize that with unemployment growing and threats of a business recession that the time is inopportune for demands for wage increases.

▶▶▶ E.C.A. authorizations of purchases of pulp, paper and paper products announced Feb. 7 amount to $800,000 for United Kingdom, $382,000 for Bi-Zonal Germany, $250,000 for France and Ireland. No newsprint is included in these figures.

SUPREME COURT RULES TO SUSTAIN FINDINGS OF FTC AGAINST BOOK PAPER MFRS.

The United States Supreme Court on Monday, February 27 sustained the finding by the Federal Trade Commission that forty-one book paper manufacturers, representing more than three-quarters of the industry have been guilty of restraining price competition.

The Court refused to hear an appeal by the Book Paper Manufacturers Association and individual members of that association from a decision by the Seventh United States Circuit Court of Appeals. The Federal Trade Commission in 1945 ordered the defendants to desist from any concerted plan of price-fixing, to exchange price lists, or use uniform sales forms. The domestic manufacturers had denied that they were guilty of any practices tending toward price control.

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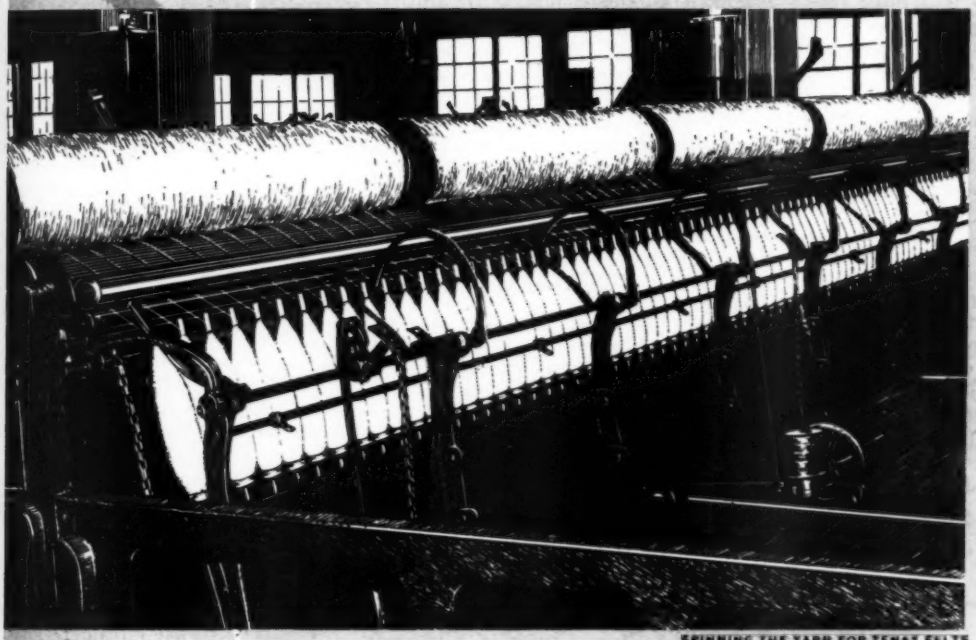
1949

TENAX FELTS

—better felts—enabling you to make better paper



SPINNING THE YARN FOR TENAX FELTS

Modern, efficient machinery—and the craftsmanship and skill of long experience combine at the Lockport Mills to bring you the finest felts for making the finest paper.

The Lockport representative in your territory is fully qualified to advise on all technical questions relating to felts. He is at your service as is our plant and all its people. We invite your inquiries.

LOCKPORT FELT COMPANY · NEWFANE, NEW YORK

Efficient and Economical Method of Preparing

High Quality Paper Coatings

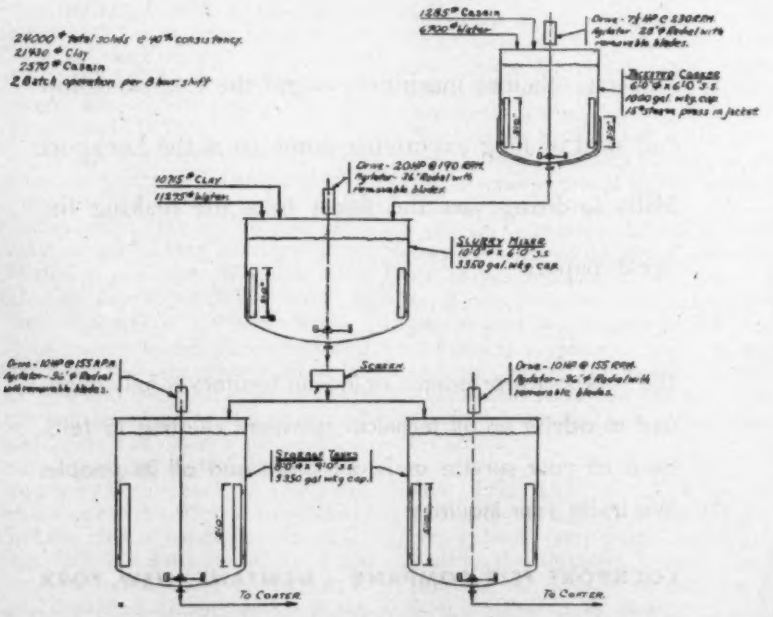
▶▶▶ PROBLEM: In the production of paper coatings each of the several stages requires thorough and intimate disperion of the solid ingredients into the liquids. The problem is further complicated by the abrasive nature of the solids which necessitates the elimination of stuffing boxes below the slurry level.

The conventional vertical shaft agitators (i.e., paddles or turbines) have been found to give insufficient shearing action necessary to shatter the solids and create thorough dispersion. The results from conventional agitators were unsatisfactory both from the factor of time required to process and the quality of the finished product.

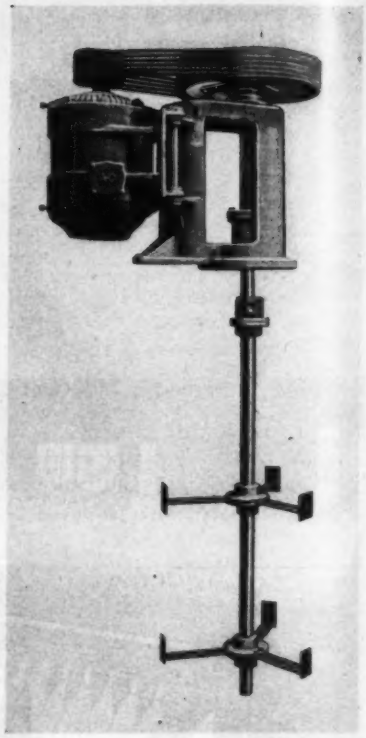
Solution: Development work in laboratory and actual plant installations has proved that the Radial Propeller agitator has the right combination of performance characteristics necessary to the most efficient processing of these coatings. The surface velocity necessary to induce the solids into the body of the slurry is created by means of the rapid overturning of the mass normally set up by the Radial Propeller. High peripheral blade speed which is found to be most effective at from 1400 to 1800 feet per minute, is the standard range for the Radial Propeller. The peculiar design of the Radial Propeller permits normal over-turning velocities combined with high peripheral blade speeds without the excessive power input which results from the speeding up of the turbine or paddle.

Coatings of average densities; that is, from 40 to 70 per cent solids, are being efficiently processed in the equipment shown on the flow diagram. Simple radial agitators are used throughout, except where the casein is cooked at viscosities sufficiently high to necessitate scraping blades in order to accelerate heat transfer through the vessel wall. Various special combinations have been developed to handle special processing formulas. A typical example of this is the combination of radial agitator and sweep for cooking caseins and starches in presence of the clay slurry, which, by the addition of certain enzymes marketed by the R. T. Vanderbilt Company, has improved the finished quality of the coatings to a remarkable degree.

Results: In several actual installations, 40 to 70 per cent clay slurries are finished in about 20 minutes after completion of the clay charge. The casein cook requires about 30 minutes heat up time and 10 to 15 minutes holding time followed by about 30 minutes cooling time. The cooked casein is introduced into the clay slurry and agitation continued for 10 to 20 minutes. The charge is then drawn to storage tanks which are mildly agitated as required.


24000 # total solids @ 40% consistency
21930 # Clay
2570 # Casein
2 Batch operation per 8 hour shift
1285 # Casein
6420 # Water
Drive - 7½ HP @ 230 RPM
Agitator 28" ϕ Radial with removable blades.
JACKETED COOKER
6'-0" ϕ x 6'-0" S.S.
1000 gal. wkg. cap.
15 # steam press in jacket
10785 # CLAY
11575 # Water
Drive - 20 HP @ 190 RPM
Agitator 36" Radial with removable blades
SLURRY MIXER
10'-0" ϕ x 10'-0" S.S.
3350 gal. wkg. cap.
Drive - 10 HP @ 155 R.P.M.
Agitator - 36" ϕ Radial with removable blades.
SCREEN
Drive - 10 HP @ 155 RPM.
Agitator - 36" ϕ Radial with removable blades.
STORAGE TANKS
10'-0" ϕ x 10'-0" S.S.
3350 gal wkg cap.
To Coater
To Coater

Flow sheet showing equipment for processing paper coating



The operation is clean, simple, economical and fast. The operation lends itself to automatic control with minimum machine supervision. Maintenance is inconsequential; there are no stuffing boxes. Bottom bearings are usually replaced with guide rings eliminating bushing maintenance. Power consumption is relatively economical.

Source: The Radial Propeller agitators used in this problem are made by the Struthers Wells Corporation, Warren, Pennsylvania (Illustrated).

▼

WORK IS RESUMED AT ST. REGIS MILL IN OSWEGO AFTER INSTALLATIONS

Following an eight-week shutdown for installation of new equipment on the fourdrinier paper machine, St. Regis Paper Company's kraft mill at Oswego has resumed production. Most of the mill's employees were kept busy on the changeover.

Work on the machine included installation of a new electric drive and new press section and other improvements, which will boost the mill's capacity approximately 20 per cent, or to 180 tons daily, after a break-in period of about four weeks, St. Regis vice president W. R. Adams said.

This installation constitutes one of the final steps in an improvement program for the mill which commenced at the end of the war at a cost of some $750,000.

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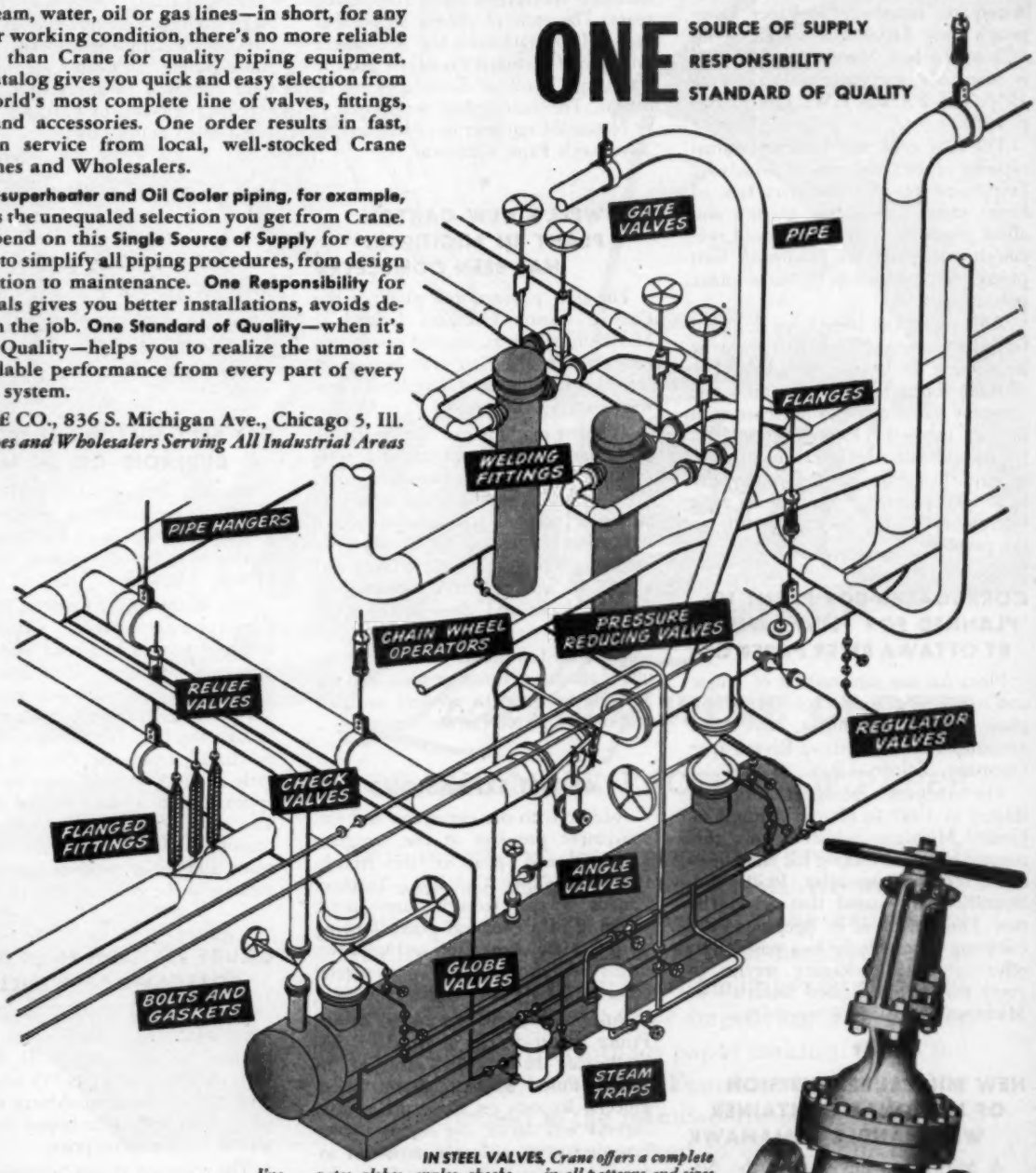

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FOR EVERY PIPING SYSTEM

CONSTRUCTION WILL START IMMEDIATELY ON I. P. CO. RAYON MILL AT NATCHEZ

Announcement was made in February that work would be started immediately on International Paper Company's new $20,000,000 rayon pulp mill at Natchez, Mississippi. The mill is scheduled for completion early in 1950. (Cf. P.I. and P.W., Dec., 1948, p. 1305)

The new mill will have an annual capacity of 100,000 tons of dissolving pulp used by the manufacturers of rayon yarns, cellophane, plastics and allied products. It is the first mill specifically designed for producing such pulps from hardwoods by the sulphate process.

Although a city bond issue designed to finance the mill was authorized by an election on January 11 (over 97% of those voting favoring the mill), the company has decided to purchase with its own funds the 1,000 acres of land for the mill site and the railroad rights-of-way, thus relieving the community of the expenditure. Arrangements were recently completed for taking title to the property.

▼

CORRUGATED BOX PLANT IS PLANNED FOR FLINT, MICH., BY OTTAWA RIVER PAPER CO.

Plans for the construction of a new and completely modern corrugated box plant in Flint, Michigan, have been announced by The Ottawa River Paper Company, Toledo, Ohio.

The company's plant in Flint was started in 1947 to fill the demand of Central Michigan industries for a corrugated plant. In making the announcement, company president, Phillip LeBoutillier, Jr., stated that when the new Flint plant is in operation, the company expects to be in a position to offer complete packaging service to every user of corrugated materials in Michigan and Northwestern Ohio.

▼

NEW MILWAUKEE DIVISION OF NATIONAL CONTAINER WILL HANDLE TOMAHAWK

A Milwaukee Division of the National Container Corporation of Wisconsin has been formed by that company for the purpose of manufacturing and selling corrugated shipping containers.

It is expected the new division will begin production very soon; a building already has been leased.

Michael Shapiro, of Milwaukee, will be general manager of the plant; David Lepper will be sales manager, and Clifford Snyder, production manager. Mr. Lepper formerly was with the Gaylord Container Corporation, and Mr. Snyder was with U. S. Corrugated Container Corporation. Mr. Shapiro, a Milwaukee man, has been engaged in various management enterprises there for many years. The men in charge stated that they will operate both the Milwaukee Division of National Container and the company's plant at Tomahawk, Wisconsin. The latter plant was acquired by National Container in 1946 from the Tomahawk Paper Company.

▼

CROWELL'S NEW CARTON PLANT IN MICHIGAN HAS BEEN COMPLETED

The new paper carton plant of the Crowell Carton Company located at Marshall, Michigan, started operations recently. Construction was begun on the plant last June and completed a few weeks ago.

The first machine put into operation was a large cutting and creasing press unit. A one-color and a two-color printing press are in operation, and a second two-color press is scheduled to arrive soon. Two folding and gluing machines are being completed. The building (82 x 162 ft. in size) is constructed of cement blocks and glass in the latest design.

The firm has orders totaling 3,000,000 eight-ounce cereal cartons, and the plant is expected to produce one-half million completed cartons a week.

▼

ABITIBI EXPANSIONS

Additions to the expansion and improvement program at the Sturgeon Falls, Ontario, plant of the Abitibi Power & Paper Co. Ltd., Toronto, Canada, were recently announced. Building of a chemical plant is being started. Major expansion and improvements are also under way at several other Abitibi plants and subsidiaries.

Pulp and paper resources in the Prince Albert district in Northern Saskatchewan have been surveyed by Abitibi Power & Paper Company engineers. Reports on these preliminary surveys will decide the company's future decisions, with speculation of informed sources favoring the Saskatchewan River Fort a la Corne area, 40 miles east of Prince Albert.

▼

OTTAWA RECEIVES PROTEST ON HIGHER FREIGHT RATES FROM CAN. P. AND P. ASS'N

The Canadian Pulp and Paper Association has protested the increased freight rates on newsprint and paper products being sent to the ports of Halifax, Nova Scotia, and Saint John, New Brunswick, according to advice received by the Halifax Board of Trade. A telegram was sent to the Board of Transport Commissioners in Ottawa, Canada, protesting the increases which were granted following rate boosts authorized in the United States freight rates case. The increases were approved to apply to Canadian exports from and to Canadian points and United States points.

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▶▶▶ FOR THE PURPOSE of manufacturing fiber cans for the frozen food and other industries, Sefton Fibre Can Company, a subsidiary of Container Corporation of America, has leased the production facilities of Can-tainer Corporation at Auburn, Washington, effective January 15, 1949. Sefton is now in active operation of the property.

▼

DRY FELT MILL PLANNED BY RUBEROID CO. IN MOBILE

Erection of a dry felt mill will be started immediately on property adjoining The Ruberoid Company's asbestos and asphalt roofing mills in Mobile, Alabama.

One of the major items in the company's postwar expansion program, the felt mill project has been under consideration for some time. Scarcity of the required materials and equipment has postponed construction until now, though the land for the new mill was purchased from the City of Mobile early in 1945. Annual capacity will be approximately 15,000 tons of dry felt. The output of the new mill will be consumed by the Ruberoid roofing plant and other producers of asphalt roofing in the South.

▼

COURT PETITION FILED BY POTSDAM PAPER MILLS CO.

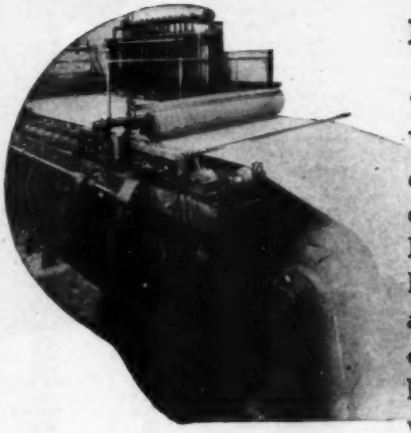
In Utica, New York, the Potsdam Paper Mills, Inc., filed reorganization petition in bankruptcy in U. S. court with liabilities of $163,753 and assets of $7,708. Cost of machinery was listed as $112,590. It is hoped it may be sold at a substantial price.

The company began business in October, 1947, and offers to pay unsecured creditors in full with notes payable 20 per cent at four-month period. The company asks permission to continue the business, pointing out that the payroll is $300 per week and the estimated loss first month would be $800 for rent and $400 for power and coal. The landlord is Reading Corrugated Container Corporation, which received $25,000 cash payment at start of three-year lease plus $9,600 per year.

Nobody ever saw or attempted to describe the beguiling Lorelei of the Rhine. Therefore we have as much right as anybody else to imagine how she might have looked. If her charm didn't include the attractions of a Valkyrie, it isn't our fault.—Editor's note.

Quality WIRE CLOTH

FOR THE MANUFACTURE OF PAPER



"No", say we, "no, sir (or madam)! We will not yield. We will *not* succumb to temptation. We will *NOT* consent to multiply production at the expense of quality." Since 1903 this has been our fixed policy. During that time all our effort, facilities and resources have gone into the task of improving Fourdrinier and cylinder wire cloth for paper making. Since the continuous betterment of Fourdrinier wire quality has contributed to the manufacture of better paper, we are all the more resolved to enlarge *our* contribution in the future.

THE LINDSAY WIRE WEAVING COMPANY
Serving the Paper Industry Since 1903
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Lindsay **WIRES**
FOR PAPER MILLS

BRIEFS

▶▶▶ PLANS FOR THE construction of a $300,000 paper box factory at San Francisco have been announced by Longview Fibre Company (a subsidiary of General Fibre Box Company). Foundation borings already have been made, but no contracts have been let, and no machinery has been purchased.

▼

▶▶▶ CLOSED FOR an indefinite period, 43 employees of The Berwin Paper Company plant at Dansville (N. Y.) are out of work. One of the oldest in Dansville, the plant had been making candy box papers, tissues, and paper napkins. The plant in Perkinsville (N. Y.) was closed recently.

▼

▶▶▶ PURCHASE OF the Nigger Island hydroelectric site, midway between Rhinelander and Tomahawk, Wisconsin, on the Wisconsin River, has been announced by the Wisconsin Service Corporation. This property was acquired from the National Container Corporation at a cost of $122,000. The Service Corporation plans to construct a generating plant on the site with a total investment of $1,300,000.

▼

▶▶▶ EXPANSION PLANS which will double the present production of American Viscose Corporation's Sylvania cellophane plant at Fredericksburg, Virginia, have recently been announced. Production of 100,000,000 pounds a year will make this plant the largest cellophane plant in the world, it is claimed.

▼

▶▶▶ A 75-ACRE WOODLOT, which will be used as the basis for a course in forestry, was donated to the Lawrence, New Brunswick, regional high school by the Eastern Pulpwood Company, Calais, Maine. A sizeable woodlot for the same purpose was recently donated to the regional high school at Plaster Rock, New Brunswick, by the Fraser Companies, Ltd., of Edmundston, New Brunswick.

▼

▶▶▶ THE BUSINESS and properties of M. S. Dowd Carton Company, Groton, Connecticut, folding carton plant incorporated in 1922, have been bought by the Robert Gair Company, Inc., New York, New York. This business will be operated in conjunction with Gair's Montville, Connecticut, mill at which the necessary paperboard will be produced.

A Bill to Adjust Postal Rates

Bill H.R. 2945 "to readjust postal rates" was introduced in the House of Representatives on February 22 by Chairman Tom Murray, of the House Committee on Post Office and Civil Service. It embodies recommendations made by Postmaster General Donaldson that would increase revenue an estimated $253,000,000. All categories of mail, except letters and airmail, are variously increased. The blueprint would quadruple the cost of publishers' second-class mail and cause many of them to go out of business. It will necessitate the uses of lighter weight paper. All of the related industries engaged in printing and publishing —including readers and advertisers—have a stake in this ridiculous bill. Hearings are now in progress—time is short to write your congressman about it.

FINANCIAL

▶▶▶ THE STOCK MARKET continued jittery through February, with paper mill securities generally following the trend of the market.

Brown Co.—Net income for year ended November 30 was $3,936,000 as compared with $2,837,682 for the previous year.

Champion Paper & Fiber Co.—Net income for three months ended December 31 was $2,622,697.

Keyes Fibre Co.—Net income in 1948 was $1,150,385 as against $769,394 in 1947.

Marathon Corp.—Net earnings for the first quarter ended January 31 were $1,180,045, compared with $1,212,840 a year before after income tax provisions.

Paraffine Companies—Net income for six months ended December 31 was $1,962,878 as compared with $1,883,033 for the same period in 1947.

Rhinelander Paper Co.—Net income for the fiscal year ended September 30 was $1,119,058 as compared with $1,200,216 for the previous year.

Robert Gair Co.—Net income for the year 1948 was $5,103,058 as against $6,010,438 for the previous year.

Strathmore Paper Co.—Net income for the fiscal year ended October 31 was $199,390 as compared with $300,542 for the previous fiscal year.

Sutherland Paper Co.—Net income for 1948 was $2,069,673 as compared with $2,364,114 in 1947.

Union Bag & Paper Co.—Net income for 1948 was $13,607,790 as compared with $11,756,608 in 1947.

West Virginia Pulp & Paper Co.—Net income for three months ended January 31 was $2,626,452 as against $2,470,229 for the comparable period a year ago.

Paper Mill Corporate Changes

Nashua Gummed & Coated Paper Co.—Without change in capital, the company has voted to add three shares of stock to each share now held by its shareholders.

Hollingsworth & Whitney Co.—A new issue of $8,500,000 in debentures and 61,510 shares of common stock will be issued to provide part of the funds required for contemplated expansion of its Mobile, Ala. mill.

American Box Board Co.—A new issue of $3,000,000 in fifteen-year, 4⅛ per cent convertibles was snapped up by investors within a few hours after being offered. The offered price was 100 and accrued interest. The issue is to finance projected plant expansion.

Southern Advance Bag & Paper Co.—Stockholders have been notified that the company proposes to buy and retire up to 1,000 shares of its 4½ per cent cumulative preferred stock at a price of 102.50 plus accrued dividends.

New York Stock Exchange—Stocks

	Closing Prices Feb. 23, 1949	Jan. 25, 1949
A.P.W. Products	*3¾-3⅞	*4-4¼
Celotex	21¼	25⅛
Same Preferred	*17⅛-17¾	17¾
Certain-teed Products	11¼	12⅛
Champion P & F Co.	22	23¼
Same Preferred	*96-97	*92-94
Chesapeake Corp.	*22½-23⅛	27⅝
Container Corp.	33¼	35⅝
Same Preferred	97	95⅝
Continental Diamond	8⅝	8⅝
Crown Zellerbach	24½	25⅜
Same Preferred	95⅝	97¼
Same $4 Preferred	*94-97	*96-100
Dixie Vortex	25½	*28½-29
Same "A"	49	*50-51
Eastern Corp.	*11⅛-12	13½
Robert Gair	6¼	6⅜
Same Preferred	*16⅜-16⅝	*17-17¼
Gaylord Container	19½	20¼
International Paper	45⅜	50
Same Preferred	*95½-97½	95½
Kimberly Clark	19⅝	20⅜
Same Preferred	*96½-97¼	*96-97
McAndrews & Forbes	32	36
Marathon	19½	19¼
Masonite	49	52½
Mead Corp.	*15-16½	17
Same Preferred	*75¼-76½	*80-82
Same 2nd Preferred	*30½-31	33½
National Container	7¼	8½
Paraffine Cos.	*17¼-18¼	18⅜
Same Preferred	*102⅜-104	*102½-104
Rayonier, Inc.	36⅜	38⅝
Same Preferred	*32½-33	33⅝
Scott Paper	47½	48½
Same Preferred	93½	*94-95½
St. Regis	7⅝	8½
Same Preferred	83¼	*83½-84
Sutherland Paper	32	35¼
Union Bag & Paper	28½	20⅞
United Bd & Carton	5⅞	8
United Wall Paper	3½	3½
Same Preferred	*21⅜-22½	22
U.S. Gypsum	98⅜	104½
Same Preferred	177¼	*176½-178
West Va P & P Co.	40¼	41½
Same Preferred	*105¼-106⅛	108½

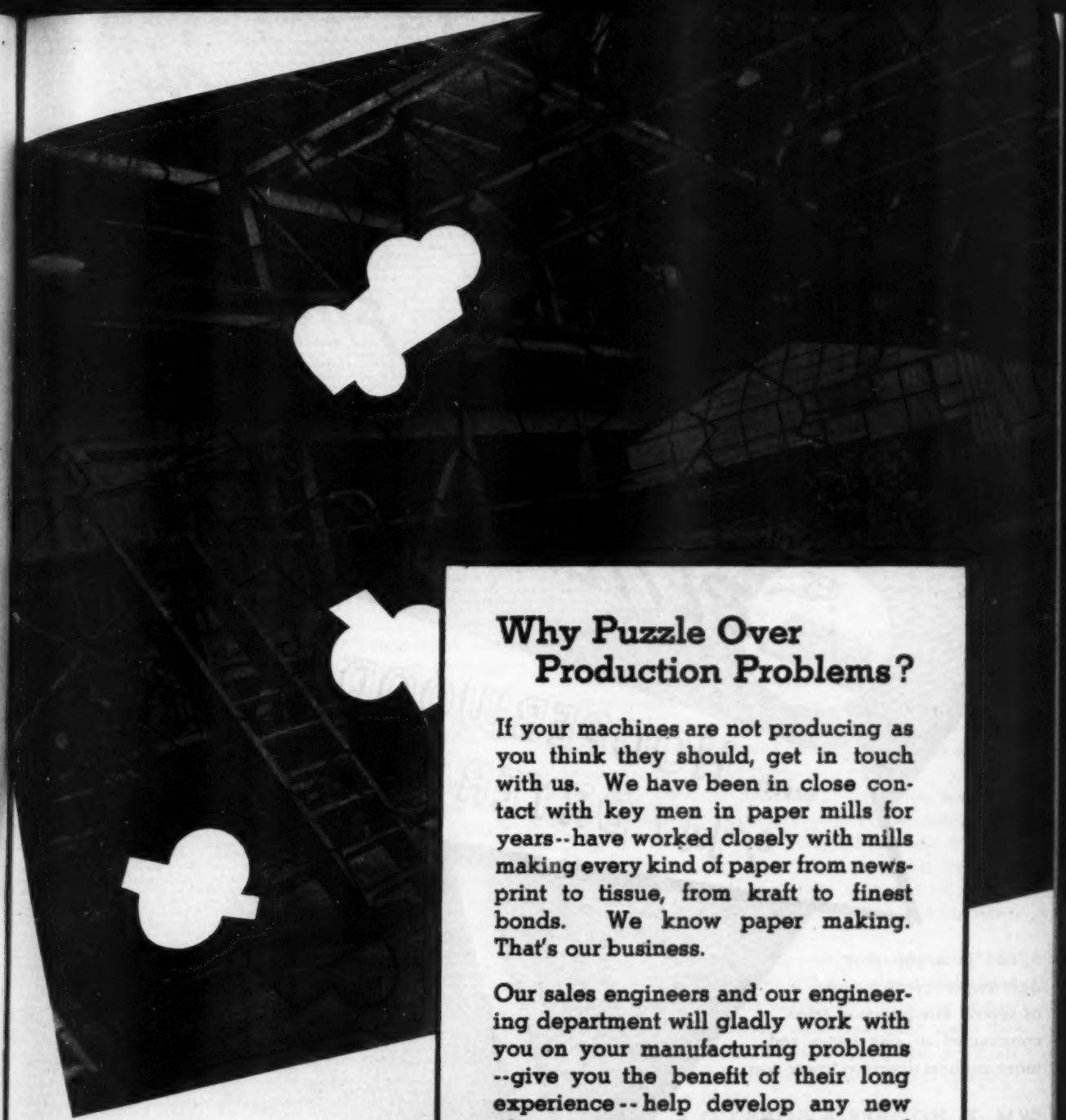
New York Stock Exchange—Bonds

A.P.W. Products 5%	91⅞	95¾
Celotex 3¼%	*101½-102	101½
Champion P & F Co 3%	100¼	100
Mead Corp 3%	*102½-103	101¼

New York Curb Exchange—Stocks

Am. Writing	5⅛	5⅛
Great Northern	36¾	37⅛
Taggart	11	11⅛

*Closing Bid and Asked Prices



Why Puzzle Over Production Problems?

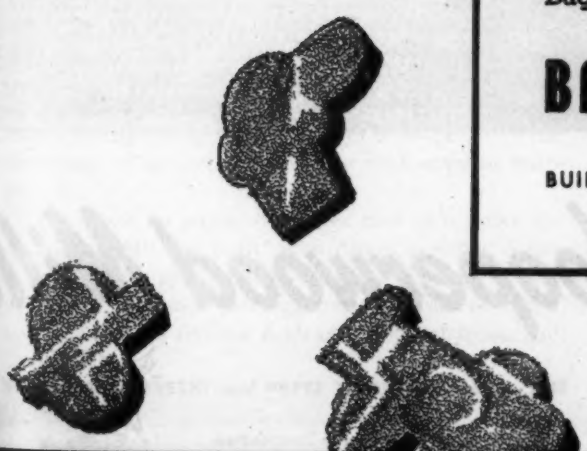
If your machines are not producing as you think they should, get in touch with us. We have been in close contact with key men in paper mills for years--have worked closely with mills making every kind of paper from newsprint to tissue, from kraft to finest bonds. We know paper making. That's our business.

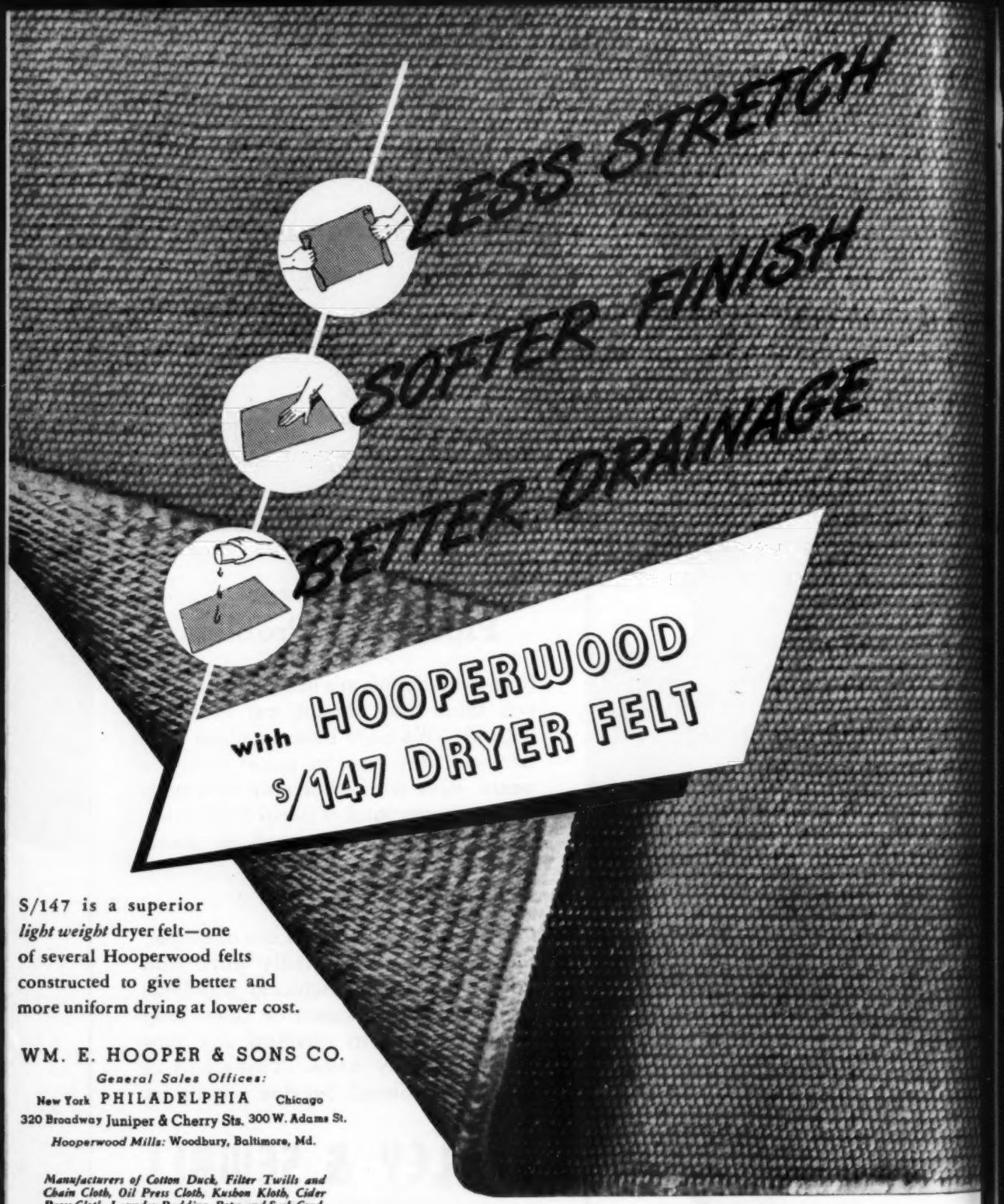
Our sales engineers and our engineering department will gladly work with you on your manufacturing problems --give you the benefit of their long experience--help develop any new ideas you may have. That's part of Bagley and Sewall Service. Write us.

BAGLEY & SEWALL

WATERTOWN, NEW YORK

BUILDERS OF PAPER MAKING MACHINERY





S/147 is a superior *light weight* dryer felt—one of several Hooperwood felts constructed to give better and more uniform drying at lower cost.

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Manufacturers of Cotton Duck, Filter Twills and Chain Cloth, Oil Press Cloth, Kushon Kloth, Cider Press Cloth, Laundry Padding, Rope and Sash Cord, Heavy Narrow Fabrics, Paper Mill Dryer Felts, and Special Cotton Fabrics.

A PRODUCT OF *Hooperwood Mills*

From only the best cotton

lls

BETWEEN THE LINES

Shall We Keep Our Freedoms?

Yes, someone saw and heard a robin . . .

but I did not need any harbinger to tell me. It seemed perfectly natural that the first mild morning of the year should set me thinking about getting some new road maps. Probably no other motorist in any one state has scattered and worn out more road maps than your reporter. Before starting on any trip I try to decide just what roads I will take and where I will turn off. This being the most sensible and time-saving procedure, you will probably be saying "So what?"

The truth is—I do all right until I come to an intersection and fail to see the road sign. Worst of all, I have a habit of turning into side roads, particularly if I see one that has the lure of thick shady branches overhanging a not-too-well-traveled road that just might wind around a hill or over a little bridge where there is an inviting spot to stop and watch youngsters wading about with fishing poles. Now and then it's been worth the extra time, but I still recall one instance when I explored a road that beckoned and it gave me the most arduous hour and a half of driving I ever have done before I got back onto the highway.

Crowding through my reflections about spring and highways and relevant matters, came the latest issue of *Business Action*, a truly barometric weekly report issued by the U.S. Chamber of Commerce. The first page is adorned with a display title "It Is Time to Choose Our Course," over an article authored by National Chamber President Early O. Shreve. The first part of this article should be broadcast to every home in this country—a *command* performance, without commercials. Quoting Mr. Shreve:

"We are truly at the fork of the road!

"We either have to choose a course that eventually will lead to complete socialism, or one that will keep us advancing in the traditional direction that has made America what it is.

"If we take the first course, we accept the idea that the government purse is *bottomless* and that it is the government's function to spend the earnings of its people in the furtherance of socialistic schemes that mask as public benefits.

"If we take the second course, we have to convince the American public that thrift, as an American virtue, is just as necessary for government as for the individual.

"As big government gets bigger, the expansion of federal operations crowds into the fields of private enterprise, and socialism gets a footing from which it will be hard to dislodge.

"I have called the steady encroachment of government into the nation's daily life and activities *creeping socialism.*

"Action is needed!"

The people of this country

are blessed with good business sense. Each family runs its own domain like a business. But there is definitely a critical need for the people to understand what must be done to protect our freedoms. As Mr. Shreve pointed out, we have come to the fork in the road. We are about to find it necessary to make a decision that will chart the future course of this nation. Shall the government *rule* the people—the totalitarian way; or shall government *serve* the people—the individual freedom way?

Harding College down in Arkansas is conducting regular Freedom Forums which all leaders in industry—from the foreman to the president—are invited to attend. This unique movement may well place Harding College as the center of economic education in this country. The Forums are supported by the Association of National Advertisers and the American Association of Advertising Agencies.

Speaking before the ANA-AAAA, supporting bodies of the Freedom Forums, General Dwight D. Eisenhower said:

"What we must do in this struggle to preserve our freedoms—which we have proved time and again are more valuable to us than all else—is to show that all of our freedoms belong together—that they cannot exist one without the other."

If every adult person in this country should humbly and gratefully accept the one thought that *Freedom Is Indivisible* and quit thinking it won't happen here, all of the people who have made this country great—and many whom the country has made great—would form the most powerful crusade of all time to counter-attack anything that threatens the American way of life.

A well-meaning attendant in another country sought to protect a great man of the Church from probable harm by opening a small black valise that had been sent to him. After removing layer after layer of wrappings, a small piece of stone was found on which was inscribed The Lord's Prayer. From the time Moses received the Ten Commandments on tables of stone, the Christian world has accepted rock as symbolic of security. Even our American forefathers landed on a rock which is a cornerstone of our tradition. The great English Poet touched this in his lines:

> ***And this our life, exempt from public haunt,***
> ***Finds tongues in trees, books in the running brooks,***
> ***Sermons in stones, and good in everything.***

—by Bessemer

IN THE field of paper coating pigments, one product is designed to provide the coated sheet with uniform brightness and uniformly superior printing qualities. It is *Wyandotte Precipitated Calcium Carbonate.*

This highly refined chemical is smooth and free from grit and abrasiveness. It is high in opacity and covering power. In the coating formula, it assures the fluidity required for the extremely high speed of machine coating.

For years, Wyandotte has made a *business* of supplying manufacturers of quality papers with this truly fine pigment. May we supply you?

Information and technical data concerning the properties and application of Wyandotte Precipitated Calcium Carbonate will be furnished upon request.

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Wyandotte
REG. U. S. PAT. OFF.

Built originally in the late 1880's and rebuilt in 1927, this strawboard mill of Ball Brothers Company, Noblesville, Indiana, is now being modernized. Much of the original equipment is still being used as shown by the illustrated flow-diagram on following page

Interest Is Reviving in

Straw Paper Manufacture*

C. G. KRANCHER
Plant Manager
Ball Brothers Company

▸▸▸ ABOUT TWENTY straw mills operating in this country today are producing about 400,000 tons of paper annually from approximately 550,000 tons of straw. The average straw mill makes from 30 to 120 tons of paper per day. However, the consumption of straw is still small compared with the total amount that is available.

Straw pulp was established in the East, and in the early 1800's it formed the principal source of newsprint, wrapping papers, and board. When wood pulping was introduced some 40 or 50 years later, it rapidly replaced straw as a source of newsprint and many other products due to the fact that it was cheaper and more readily available raw material. As the wheat growing areas in the Midwest became more extensive, the majority of the straw mills moved to this section. This was in the early 1900's. Development of the corrugator and railroad approval of the corrugated board box provided the much needed stimuli to the new midwestern straw paper industry. Since that time straw mills have been the principal source of 9 point corrugated.

In recent years, the wood pulp industry has re-entered the corrugated field to make a sheet that is competitive with 9 point strawboard. Likewise, during the war, some bogus 9 point was made of wastepaper.

The estimated annual wheat straw production in the United States is around 77 million tons, of which some 46 million tons are estimated as being recoverable. At present, the straw mills and the farmers together use approximately 13 million tons of straw, leaving roughly 33 million tons that might be used by the paper industry.

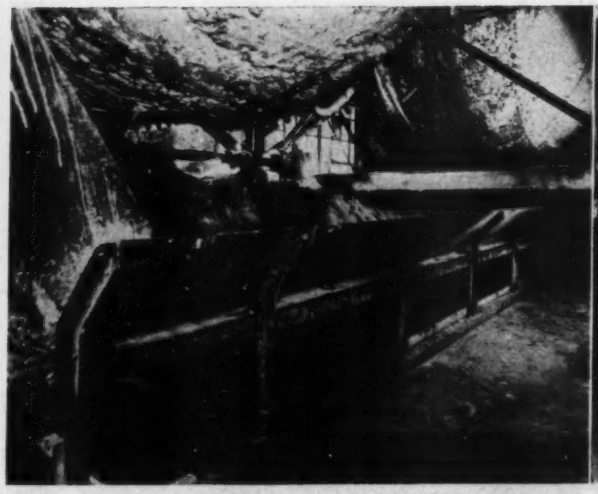
Characteristics of Straw Paper

A typical sheet of 9 point strawboard has a basis weight of from 28 to 32 pounds per 1000 sq ft ream. Moisture content on a roll ready for shipment varies between 6 and 8 per cent. Other factors, such as Mullen, tear, tensile and other specifications are checked. However accent is on a stiffer sheet of strawboard and that is what the industry is striving for; thus stiffness has become the most important specification.

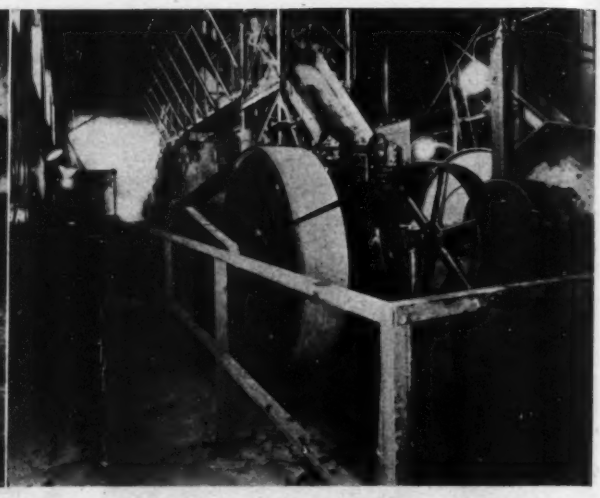
Strawboard in roll form is shipped to the box shop to be converted into corrugated board. Here the board is passed through a set of steam-heated, fluted rolls somewhat resembling a pair of spur gears running together with ample clearance. Prior to passing through the steam-heated rolls, the sheet is moistened by means of a steam shower. From the corrugator, the sheet is carried by conveyor to the glue station where starch or silicate is applied to the tips of the flutes. Jute or kraft liners are then pressed onto the glued sheet. A liner applied to only one side of the corrugated sheet results in what we call a single-faced sheet, while the double-faced sheet consists of a liner applied to both sides of the sheet.

From the combining section, the sheet is carried over a series of flat

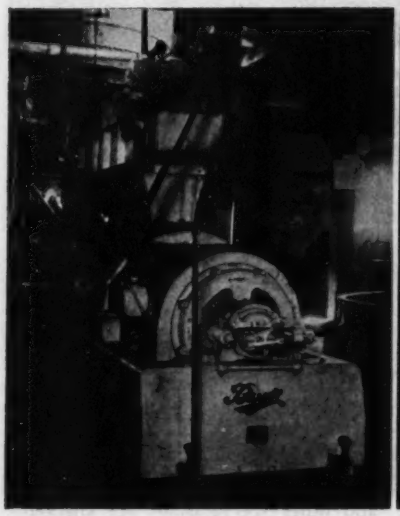
(*) Presented as one of the Black-Clawson-Shartle-Dilts lecture series, at Shartle Brothers Machine Company, November 3, 1948.



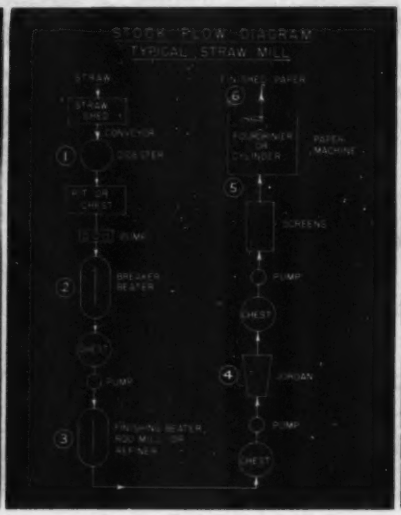
1 *ROTARY DIGESTERS discharge stringy straw pulp to conveyor that carries it to a chest or breaker beater*

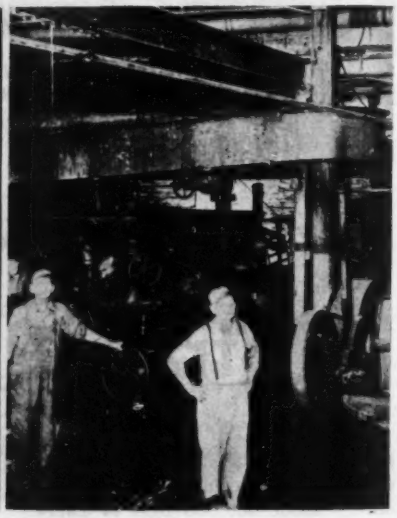


2 *BREAKER BEATER with drum washer, receives pulp from conveyor and shortens stringy fibers to about 2½ in.*

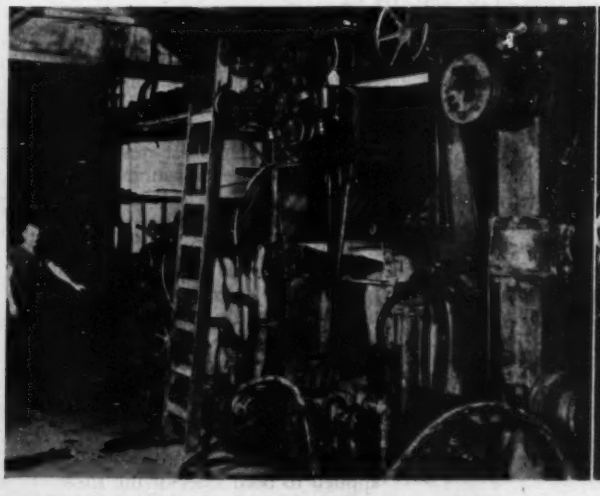


3 *REFINER—double disc refiner installed last year as part of a modernization program now replaces conventional type of beater*

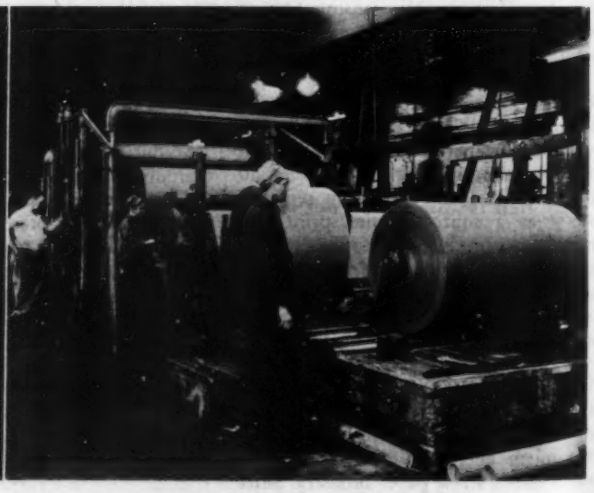




4 *JORDANS refine the straw pulp to about 200 freeness (Can. Std.) before it is screened and sent to the paper machine*



5 *PAPER MACHINE—single-cylinder with suction primary press, 300 fpm, 110 in. trim, 50 tons per day*



6 *REWINDER—9-point corrugated is slit and made into different diameter rolls on a 4-drum rewinder*

plate dryer sections for a distance of 50 to 60 ft, or until the adhesive is set. It is then cut to the proper size and conveyed away to be made up into boxes.

Raw Materials

Principal raw materials in the manufacture of straw papers are the cereal straws: wheat, oat, rye, and some barley, rice and soy bean. In the midwestern area, the main furnish is wheat and oat straw. This furnish is supplemented with wastepaper for several reasons: one reason being that wastepapers are usually a little cheaper than straw, and secondly, it contributes to better running qualities of the straw pulp as it runs on the paper machine.

The analysis or typical composition of wheat and oat straw are shown in the table. Hemicellulose, protein, and pentosan, along with the undissolved ligins are the papermaking materials that make up the sheet. The important characteristic of straw paper is the long thin fiber that is adaptable for corrugated. Compared with wood fiber, straw has 111 to 1 ratio of length to diameter where soft woods have 75 and 85 to 1 and hardwood even less with ratios from 38 to 50 to 1.

Typical Composition of Principal Straws

Kind of Straw	Constituent (per cent)						
	Water	Ash	Cellulose	Fat and Wax	Protein	Lignin	Pentosan
Wheat	10–14	4–6	36–38	1–2	2–4	24–26	20–24
Oat	10–14	4–6	38–40	1–2	2–4	23–25	20–24

Straw Procurement

In earlier days, practically all straw gathered for straw mill consumption was threshed straw. Gathering of threshed straw differs from modern combine methods in that it is cut closer to the ground, bundled into sheaves, and then shocked and then left in the fields until such time as it is threshed. During the threshing operation, the straw is thrown into large stacks and then baled with a stationary baler. Here the straw is cut close to the ground where the fibers are tough and contain a little less pith than is found in the upper portion of the straw.

This method of gathering straw has largely been replaced by use of combines. Using the combine, the wheat is cut and grain removed all in one operation. Straw is scattered in the field and is later picked up by traveling baler. Straw gathered by the combine method is generally longer than threshed straw because it is not handled as roughly, but a valuable part of the papermaking material has been left on the ground.

The bulk of the straw has to be taken to the mill and stacked in the yard. In recent years some mills have set up stacking points in surrounding areas where small piles of several hundred tons to larger ones of several thousand tons of straw are stored. The straw is then shipped to the mill when required.

Straw usually is made into bales about 16 in by 18 in by 38 in, or 17 in by 22 in by 38 in. For the most part, wire is used for baling, but some baler men bind the bales with twine. Bales can weigh from between 40 to 100 pounds each, but most of them average between 60 to 70 pounds. From a materials handling standpoint, a heavy dense bale is preferred. The disadvantage of light bales, of course, is one of transportation. When shipped by railroad, the weight of the shipment will average 10 to 11 tons of dry straw, which is on the borderline of minimum required carloading. Freight costs are sometimes in excess of cost of the straw loaded in the car, especially for long-distance shipping. To get a heavier denser bale delivered to the mill is a major problem.

Farmers usually truck the straw into the mill where the entire load, truck and all is weighed before the grader inspects the straw and grades it for weeds and moisture. Weed content must be considered especially during the latter part of the straw season, particularly seasons that have had a great deal of rainfall. By keeping close check on weed content, a good grader can save a mill considerable money and prevent the production of inferior paper.

Straw that isn't consumed by the mill during the straw season is usually stacked in ricks in the yard. This generally amounts to about 60 to 70 per cent of the mill's total yearly requirements. Ricks, or stacks of straw, are generally stacked about 30 ft high, 35 ft wide and anywhere from 80 to 100 ft long. A conveyor is used to haul the bales from truck to car to a height of from 25 to 30 ft. It takes a crew of about six men to build the stacks. Considerable loss is experienced due to straw decay. It has been found, however, that by applying borax on top of the straw stacks, a reduction in the loss of straw by decay is achieved.

Preparation of Straw Pulp

From the straw shed a drag conveyor carries the straw up to the digester house or rotary house. Rotaries are usually arranged in batteries, between 6 to 14, in several aisles. Here bales are again stacked on the concrete charging floor, usually in piles 10 to 12 ft high. As the digesters are charged, the straw is pulled down to the mouth of the digester by means of a pole with a hook on the end of it. Bale ties are broken and the straw charged into the digester.

Fourteen-foot diameter spherical digesters hold up to six tons of straw, amounting to 120 to 160 bales. Cooking pressures range from 5 to 60 pounds. Chemicals as a rule, are added in liquid form. Lime was the accepted cooking chemical during the earlier years, but in recent years soda ash and caustic have been used with lime. Now, however, there is a trend toward the use of neutral sodium sulphite. The chemical charge is usually from 6 to 9 per cent the weight of the straw. The cooking period varies between 3 to 10 hours.

In many cases, the whole charge of straw is not put in at once, but is broken down to several smaller batches which are allowed to wilt down under cooking pressures for about 40 minute periods. In this way, the capacity of the digesters can be utilized fully.

After the cooking cycle, the digester is blown, then turned bottom-side up, dumping the charge onto a conveyor which drags the cooked straw either into a pit or a chest, or directly to the breaker beater. At this point, the straw is a mass of stringy material, although considerable shortening of fibers has been effected by the tumbling of the digester. In the breaker-beater the stringy mass is reduced to shorter fibers, generally on the order of 1 to 2 inches in length. These beaters are equipped with drum-type washers which wash the straw partially free of residue and chemicals, after which the pulp is dumped into a chest. Subsequent beating and washing shortens the fiber and lightens the color.

Washing of the pulp has not been considered too important. More thorough washing, however, eventually will become a necessity in strawmill operation if higher quality papers are to be made. From the storage chest, straw then passes through finishing beaters or through various types of refining such as disc refiner, rod mill or attrition mill. It is then jordaned before being screened and sent to the paper machine.

Although fourdrinier machines are used in making strawboard, the majority of the mills use the cylinder ma-

chines. In the earlier days, a single-cylinder, wet-end was common, but today most of the machines have from two to five cylinders.

Board Machines

The machine usually has a suction drum roll, possibly a suction primary and a few plain presses. Most of the older machines are equipped with plain presses, but there is a definite trend toward suction presses. Some mills installed suction presses in the second press position. The sheet then goes through a pair of smoothing rolls before entering the dryer. Most of the straw mills use two-deck dryers equipped with bottom dryer felts for handling the relatively lightweight straw papers as compared to board. Some mills use triple deck dryers and in other cases stack dryers are used.

Straw paper requires little calendering. While some machines are equipped with two calender stacks, a single- seven- or nine-roll stack is sufficient for most straw papers. After the sheet is reeled up, it is usually rewound on a four-drum winder. The four-drum winder is popular due to the fact that various corrugating machines require different roll diameters since their roll stands are set at different heights.

Most strawboard machines vary in width between 68 and 118 in. and run between 250 and 500 fpm. Open gear drives are gradually being supplanted by totally-enclosed drives with flat belts and cone pulleys driven either by turbine or d-c motors.

Quality

A demand for greater stiffness has been brought on by the railroads in an effort to reduce their costs from damaged goods shipped in corrugated boxes. Stiffness, or ability of the sheet to resist flat crush, is pretty much determined by resistance to crush in the machine direction, although there is a tendency today among boxmakers to want a greater cross-direction strength as well.

One of the most important factors is uniformity. In the past, much of the straw board hasn't been as uniform as desired, and the boxmaker is now asking for sheets of more uniform caliber. More uniform moisture content and a better formed, denser sheet are required to meet market demands.

Lower Cost

Along with the problem of quality is that of lowering costs. One of the important things is to reduce the number of man-hours per ton of paper, making it desirable to simplify the process and to operate at higher machine speeds. Straw handling costs are high. Because it is a light, bulky material, it takes considerable handling and labor to get straw into the digester room for processing. More uniform cooking—either a continuous or a faster batch-cooking process—is desirable. More uniform stock preparation and a more adequate control and testing program are necessary.

Considerable work has been carried out on cutting straw with ensilage cutters or shredders, and a more satisfactory pulp can be produced with cut straw than with whole straw. Pulp is more uniform and there is a noticeable lack of raw or uncooked fiber in the product. Time of cook can be shortened and the time taken to discharge the conventional digester after cooking can be cut from 30 to 45 minutes.

So far, a drawback to this idea has been the fact that the proper equipment for this job is not available. Some mills have tried ensilage cutters, hammer mills and shredders. While these cut the fibers, they do produce an excessive amount of fines, as well as having a high labor and maintenance cost. A machine is needed to cut the straw about two or three inches in length with a minimum of labor, power, maintenance, and loss of fiber.

While there are a number of different methods of cooking straw, one successful continuous cooking process is known as the "Morley" process. This has been used in England and it lends itself to a streamlined, continuous flow from one end of the mill to the other. Straw is fed into an ensilage cutter, blown upwards to a cyclone separator, from which it is discharged to a tube about two ft in diameter and about 35 ft long. The tube is equipped with a spiral conveyor which moves the straw along through the tube. Caustic liquor is introduced at the inlet and steam is introduced at relatively low pressure at several points along the length of the tube. From here the straw passes to several similar tubes where cooking is continued. From the final digester the cooked straw is discharged at atmospheric pressure to a perforated drum where water is introduced and washing takes place. After washing, the stock is discharged in pulp form.

This process was designed where caustic liquor was available in rather inexpensive form and it is questionable whether it could be used where caustic liquor is scarce and expensive. However, the principle of using a continuous process is one that should be applicable. A continuous system has an advantage over conventional methods in that it greatly reduces the labor cost. Processing would be cheaper and a more uniform product would result.

Tests have been made on the application of the Hydrapulper which show that it does a good job of getting the straw into shape for cooking. Fibers were shortened in a matter of five to ten minutes, but this is accomplished in a rather low consistency suspension. This presents a problem of dewatering stock prior to cooking. Cooking tests also have been run on the Hydrapulper indicating its possibilities for use in cooking straw pulp. Although considerable research is yet to be done, there appears to be a possibility that this machine can be developed for use as a continuous digester.

FACTS ABOUT THE 9 POINT STRAW BOARD INDUSTRY

Raw Material	Wheat, oat and rye straws, some rice, barley and soybeans
How Received	Bale form weight 40—125 lb., size 16 in. x 18 in. x 38 in., or 17 in. x 22 in. x 38 in.
Cooking Methods	4 to 8 hours in rotary digestors at 5-60 lb. pressure
Straw Charge	3 to 6 tons per digester
	Yield—60 to 70 per cent
Chemical Used	6 to 9 per cent by weight of straw lime, soda ash, caustic soda, and sodium sulphite
Stock Preparation Equipment	Breaker beaters, sugar presses, rod mills, beaters, refiners, and jordans
Beating or Refining	2 to 3 hours total
Washing	Drum washing in beaters, decker washing
Screening	Flat and rotary screens ahead of machine
Supplementary Furnish	15 to 35 per cent of waste paper, principally old corrugated
Waste Paper Preparation	Breaker beaters, or hydrapulpers
Type of Paper Machine	Cylinder or fourdrinier
Cylinder Machine	1 to 5 cylinders, suction drum roll, primary presses, plain press, suction press, smoothing rolls, dryers, 7-9 roll calender stack, reel and winder, variable speed drive, either d-c or turbine
Machine Speeds	250 to 550 fpm. Widths—68 in. to 118 in.
Finished Paper Characteristics	28 to 32 lb. basis weight .009 in caliper, 6-8 per cent moisture and a smooth finish
Most Important Specification	Stiffness, at least 21 MD -14 CD
Paper Production	400,000 tons annually
Consumption of Straw	550,000 tons annually
Number of Mills Producing	20
Daily Production of Straw Mills	30 to 120 tons daily

Illustrative of a well-planned and conducted conference are these scenes from a meeting of Bird & Son chemists held in Boston. (Pictures used through courtesy of Bird Neponset Review)

When You Lead a Conference

ALFRED M. COOPER

The author has had wide experience in the technique of conference leadership. He has conducted more than ten thousand conferences and trained large groups of executives as conference leaders. Also he has acted as a consultant to a number of prominent industrial companies and has authored several books on the subject of conference leadership.

▶▶▶ THE CONFERENCE IS becoming increasingly important as a device for getting things done throughout all American industrial, commercial, and governmental organizations. Like Congress, the business conference has had a lot of fun poked at it, but every executive, labor leader, safety engineer and educational director appreciates that we could not for long do business nowadays without conferences —just as this country could not long continue as a democracy without an independent Congress. And today all legislative bodies function through committees rather than as a result of the emotional appeal of oratory.

In industry, the conference most commonly takes the form of a departmental meeting, in which the head of the department leads a discussion with a group made up of his subordinates. Here the leaders' idea usually is that of pooling the brain-power of 20 or 30 assistants and utilizing this knowledge to improve the working of the department. Sometimes the executive has in mind *selling* certain ideas to his conference group, and if this sort of thing is not overdone or too often practiced, it can be carried out successfully along lines we will later discuss.

The conventional departmental business conference has developed some interesting by-products. As of today, the bona fide conference has supplanted old-fashioned oratory as a means of ironing out differences in labor-management discussions, and the conference also has been successfully utilized, ever since 1914, as a method of training industrial and commercial employees. In the latter field, training by conference method has been carried on principally with foremen, with public contact employees, with salesmen, and with employees whose duties are of a hazardous nature.

In general, all training conferences are conducted with groups in which the employees already have had long experience in their line of work; the idea being not to tell these people how to run their jobs, but rather to epitomize all of the information on this subject possessed by a given group, and then make this knowledge available to every member of the group. Only through discussion can this be done.

The conference leader who can train employees by this method has a distinct advantage over the instructor who knows only how to harangue a group. All employees much prefer to participate in an interesting discussion rather than to listen passively to one man's opinion.

In safety training it has been proved repeatedly that among a group of 20 or 30 employees, each actually knows more about this subject, as it applies to his own department, than does any single individual in the plant. The safety instructor's job is not to tell the workers how to avoid accidents, but to encourage these workers to develop, among themselves, methods of working safely. As every safety engineer knows, mechanical safeguards can go only so far in preventing accidents. Severity and frequency rates of employee injuries drop sharply only after the individual workman has learned, through discussion, how best to think safety 24 hours a day. This is the human factor in accident prevention that was so largely absent in many of our war industries, and which, even today, has not received anything like the attention it deserves.

Labor relations conferences, we may assume, consist of groups equally representative of labor management and plant management. The important question then is: who is to lead such a group, displaying as he must the fairness and impartiality which are fundamental characteristics of any good conference leader?

Ordinarily, the leader of such a conference will be the industrial relations executive of the corporation. However, on occasions I have witnessed excellent conferences of this type in which the meetings were conducted by a superintendent or manager of the plant in question. The reason these meetings were successful had nothing whatever to do with this man's position in the company. Rather, it happened that this individual knew how to lead a conference and get results regardless of how far from agreement the opposing elements were at the opening of the discussion.

One vital point, which should be borne in mind by the man who leads any labor relations conference, is: Begin your discussion with certain minor points of difference that may exist between the factions present, and clear these up thoroughly, once and for all, before going on to the really important discussions, which probably will cover actual future wage scales and improvements in working conditions.

The reason for such an approach is that, once a group has solved a single problem by mutual contribution to its solution, it is much less difficult to

secure consensus from this group on the tougher problems to come. And the reason for *this* is simply that, in working out the solution to the simple problem, *the group has also been taught to confer properly.*

Because we have all had to spend so many hours passively listening to someone tell us about something, we have often erroneously assumed that a conference group, like a speaker's audience, automatically knows how to conduct itself in any discussion. This is seldom the case, and it is this lack that is so often responsible for conferences which accomplish little or nothing.

Appreciating that it actually may be necessary to teach any group to confer, I frequently issue the following "rules of order" to a group with which I am meeting for the first time.

Conference Rules of Order

1) The leader has no ideas to present to the group. All decisions will represent the consensus of the group.

2) Everyone is expected to participate in the discussion freely and voluntarily, but no one will be called on for an opinion.

3) Talk one at a time. Please refrain from private conversations, out of courtesy to the man who has the floor.

4) Express your opinions briefly.

5) We expect a difference of opinion, but no one should get angry if others differ with his opinions.

After issuing these rules at the beginning of the opening meeting of a series, it is not difficult to correct individuals in the group who fail to live up to these rules. After a single meeting it will rarely be necessary to refer to the rules again. Particularly, the too-talkative group member may then be readily suppressed and all whispered asides between group members brought to an end. This group may then indulge in red-hot discussions, but it will always get results.

Regardless of the nature of the conference—departmental business, training, labor relations, or whatever—there are certain points that must always be kept in mind by the leader if his meetings are to be successful. Certain of these factors follow.

There are only two legitimate reasons for calling any conference: First, the executive who calls his associates or subordinates together wants to get the opinions of the group members, and from them evolve a plan of action. Second, he has a plan of action in mind and wants to sell his idea to the group through open discussion. A conference called for any other purpose is a waste of time. So is one called by an executive who does not know how to lead a conference.

No conference should be called simply to issue an order. Unless the executive feels it advisable to sell the group on the need for the order, a memorandum is much better. And if the object of the meeting is to sell an idea to the group, it is best not to state the idea at all, but to lead the discussion in such a way that it appears to come from the group itself. The conference leader then needs only to put his stamp of approval on the suggestion, feeling—and rightly—that the idea will be executed with greater good will because members of the group feel that it originated with them.

The purpose of any conference is to promote free and open discussion, and to direct this discussion skillfully to a useful conclusion. The surest way to kill discussion is for the leader to talk too much. This is particularly true if he opens a meeting of subordinates with a flat statement of his own opinion, then asks the members of the group to express their opinions.

Under no circumstances should the leader call upon individual group members (usually done by going around the table from left to right) for an expression of opinion. In a properly conducted conference everyone will talk because he wants to talk; nobody likes to be asked for an opinion until he is ready to talk and then it isn't necessary to ask him.

Whether you are honestly trying to get ideas from the group, or whether you are trying to get an idea over to the group, you conduct the conference in much the same fashion. You avoid flat statements of your own opinion, and lead the discussion by asking questions of the entire group.

The first question follows a brief statement of the purpose of the meeting. Once the question is put it should not be repeated or rephrased unless someone indicates that he doesn't understand it. Give them a chance to think. Out of the batch of responses to this opening question, the leader selects the response on which he can build his first follow-up question. From this point on, the two types of conference call for slight differences in method.

If the object of the meeting is to work out a plan of action based on the group's opinions, the first follow-up question should promote further discussion of an idea that sounds good to the leader. He can soon decide from the response whether or not the idea is worth-while. Succeeding follow-up questions are extemporaneous, based entirely on the responses received from the group. Each suggestion is explored until both the leader and a majority of the group are satisfied with the solution offered, which is likely to be a compromise or combination of two or more suggestions. The leader then sums up what has been decided, the secretary records the decision, and the meeting ends.

In the second type of conference—called to sell the group on a particular idea—follow-up questions are based on the responses which come closest to outlining the plan the leader is trying to sell. But these follow-up questions must not indicate the leader's preference.

The leader closes this type of conference in the same way he closes the other—summing up the decision and having it recorded. In either type of conference, the leader may interrupt the discussion every so often to sum up the points brought out that far. He will also do well to give credit to individuals for their contributions, but without giving approval or disapproval of their ideas. This encourages the silent ones to get into the discussion voluntarily.

An experienced conference leader can get any reasonable agreement he wants to from a discussion group. Even if the group is antagonistic, he may still win his point by adopting a "negative" style of leading: From time to time the leader gives little indications of his own opinion, in the wording and inflection of his questions; but his apparent preference is the opposite of the conclusion he really wishes the group to reach. I have never known this device to fail with an obstreperous group.

If the idea you are attempting to sell cannot be made to appear reasonable to an intelligent, co-operative group, you had better forget it. If you once override a group's consensus with a conflicting order, you may as well handle all future orders to that group through memoranda.

Nine Conference Suggestions

Other suggestions for better conferences include:

1) Make the group comfortable. Never hold a conference in a stuffy or uncomfortable room. Preferably, a conference group should be seated around a table. Never attempt to hold a conference with more than 35 people; 16 to 18 group members is ideal.

2) Repress your desire for self-expression. Limit your participation to 20 per cent or less of the time, and make your contributions principally in the form of questions.

3) Don't use leading questions which indicate your own opinion or the nature of the response desired—either by wording or inflection—except when leading by the "negative" method.

4) Don't allow anyone to hog the discussion. If a group member is talking too much, ask the group as a whole not to let Mr. Smith do all their talking for them. If this doesn't work, you may have to ask him to give somebody else a chance to talk.

5) Keep the group on the subject.

6) Keep the discussion *interesting*. Interest can be accurately gauged by the vehemence of responses, the degree of difference in opinions expressed, and whether or not you are receiving responses from everyone present. Interest can be won by applying the suggestions in this list.

7) Put a laugh in once in a while; it relaxes the group and relieves tension. Don't do this by telling a funny story. There is always a chance to develop real humor out of the discussion itself.

8) When dealing with a strange group, expect some obstreperousness and even outright hostility. Meet this calmly, ignoring any contributions which are obviously intended merely to obstruct the meeting. If you are to lead discussion with this group regularly, talk to the troublemakers individually and privately, between meetings, and see if you can't win them over. If all else fails, crack down on them hard.

9) Finally, never dismiss a conference group until a definite conclusion has been reached, preferably by vote. See to it the group appreciates that something definite has been accomplished in the meeting. This should be emphasized in the leader's summary at the close of the discussion.

Advanced or Preventive MAINTENANCE

THOMAS W. ESTABROOK, Consultant

▸▸▸ THE CONDITIONS surrounding the continuous operation of plants manufacturing wood pulp and/or paper are extremely difficult by comparison with those in other fields of productive effort.

With the present cost of construction and erection of a modern paper machine and its auxiliaries running to more than a million dollars, and that of a relatively small chemical pulp mill soaring to several times that amount, the resulting overhead charges are so great that every possible means must be employed to keep the equipment in such condition that interferences with the steady outflow of product may be at the lowest possible point. Tonnage lost today cannot be regained tomorrow. Failure of any one part of the continuous train of preparation apparatus causes either immediate or soon-experienced cessation of final output, as storage of in-process materials between contributing units is either impossible or of relatively inconsiderable amount, depending upon the point in the process where the deadlock takes place.

Builders of modern papermaking machinery have made many and valuable improvements in design looking toward the desired goal of uninterrupted production in pulp and paper mills. However, the majority of mills in the United States are equipped with paper and pulp machinery which is more than ten years old, and which is now being operated at speeds and pressures far greater than those for which it was designed. For example, it will be recalled that the standard speed for newsprint, not so many years ago, was 440 fpm. Many of these old machines, with wires up to 160 inches in width, are presently being operated at double the speed for which they were constructed, with consequent increase in strain and the resulting tendency toward breakdown.

While the increased unit cost of maintenance, due to higher-cost materials, higher labor rates and lower labor-efficiency is a thing to consider, there is still a wide spread, even under these conditions, between these inflated costs and that occasioned by loss of output. It is, therefore, of great importance to survey all of the means by which this spread may be continued and possibly increased, through eliminating interruptions of salable production as far as may be possible.

Participation in the campaign to reduce production losses due to insufficient maintenance is not, of course, confined to the mechanical trades or to their direct leadership. Also involved are the Mechanical Research and Engineering, Inspection, Statistics, Purchasing, and Storeskeeping departments. It may at first sight seem that some of these may bear very lightly on some special problem of maintenance and this may well be true of the case in point, but over any wide range of work it will be found that one or more of these agencies materially aid in the desired result—a Fifth Freedom—freedom from interruption!

Invention Analogy

Although the comparison is perhaps sometimes strained, it is interesting to consider the points of resemblance between the individual man, and a piece of apparatus in a paper mill.

Mothered by Necessity, and fathered by the Manufacturer (duly guided by mechano-chemical eugenics) little Invention is born, to later perform, as Auxiliary Apparatus, a certain operation in the society of other auxiliaries, the concerted effort being exerted toward a definite goal—in this case, the

(Turn to page 1755)

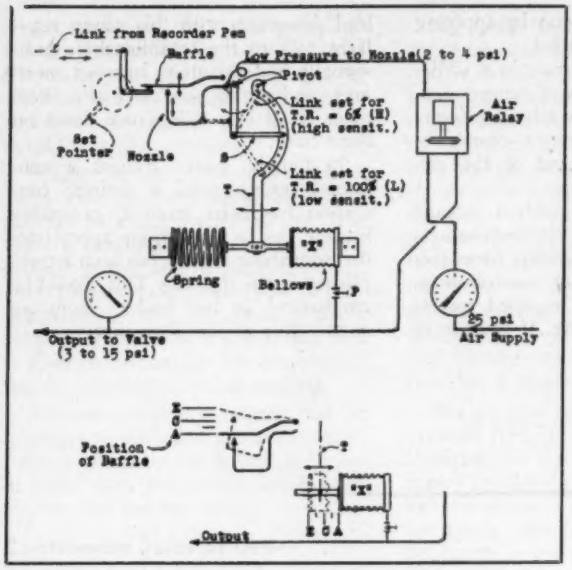


Fig. 1—Air pressure from relay causes bellows to move nozzle in accordance with baffle position

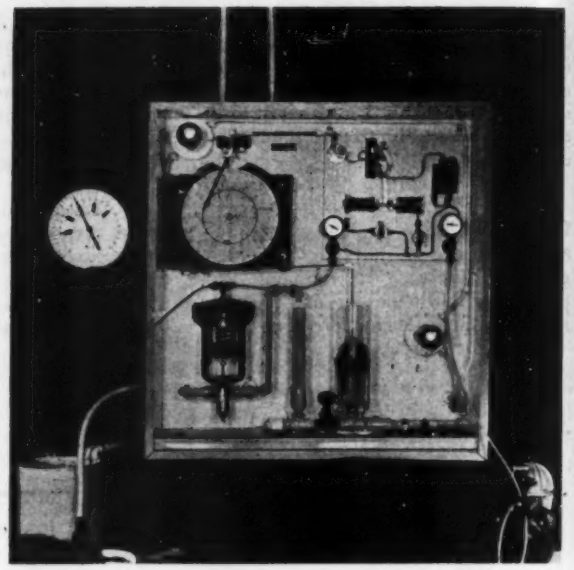


Fig. 2—For any position of pen on chart, the output pressure will become a corresponding and proportional value

Automatic Control Principles Are

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EDITOR'S NOTE: Three parts of a lecture course, designed by the author and used by him to teach the fundamentals of instrumentation, have been published in this magazine. This article concludes the series; the first two parts have appeared in the January and February, 1949, issues of THE PAPER INDUSTRY and PAPER WORLD

▶▶▶ AN UNDERSTANDING OF the principles involved in design of a proportional controller (Cf. THE PAPER INDUSTRY AND PAPER WORLD, Feb. 1949, pp 1618-23) is aided by applying these principles in a controller unit as in Figure 1. This unit produces proportional and linear action for every position of the baffle which is itself positioned by the recording pen. Pen motion is transmitted to the baffle and a pivoted lever lifts or lowers the baffle through a distance of 0.25 inches as the pen traverses the full width of the chart. Below the baffle, a nozzle rotates about a pivot providing continuous alignment with the baffle.

Back pressure created by the nozzle is carried to the air relay and an instant change of output pressure is created by the slightest change in low pressure impulse from the nozzle. Air output from the relay is split, one line constituting the output from the instrument, and the other furnishing air to bellows X. A spring located opposite the bellows provides a movement proportional to change in output pressure. Bellows and spring are designed for a total travel of one-half inch when the output from the instrument changes from 3 to 15 psi. Lever T, pivoted at its upper end, is so arranged that any change in position of the bellows will be transmitted to the nozzle unit by means of adjustable link S. With this link set in the extreme lower position (point L), the bellows motion of one-half inch will cause the nozzle to move 0.25 inches. For every value of output pressure, there is a definite and corresponding position of the nozzle.

As we place the baffle in the midposition of its 0.25 inch travel and turn on the air supply to the instrument, the clearance existing between the nozzle and baffle will cause the output pressure to rapidly climb to 9 psi and thus force bellows X to expand to its midposition of travel. This motion, transmitted through link S will cause the nozzle to move to its midposition of travel and thereupon establish a clearance with the baffle of 0.004 inches. Slightest deviation from the 0.004 inches clearance will cause an immediate change in output and thereby produce corrective action through the bellows and linkages to reset the nozzle. For any other position of the baffle, a corresponding output pressure will position the nozzle at the prescribed distance from the baffle.

We are now ready to place the proportional controller in operation on the demonstration panel (Figure 2). The pen arm of the recorder is linked to the baffle unit; supply air is admitted to the relay and the output line is connected to the controlling valve.

Setting link S in the extreme lowered position to produce a throttling range of 100 per cent, we will now investigate the proportional response of the new device. When the recording pen is at 0 on the chart, the output from the controller becomes 3 psi and the control valve is fully closed. With the pen arm at 50 on the chart, output reaches 9 psi, and finally as the pen is moved to 100 on the chart, the output increases to 15 psi and the control

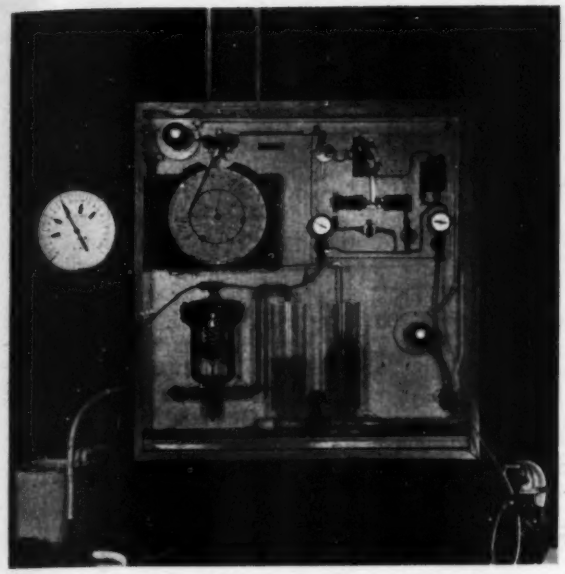

Fig. 3—Time lag is introduced between inflow and float level by using two tanks with a restricting valve

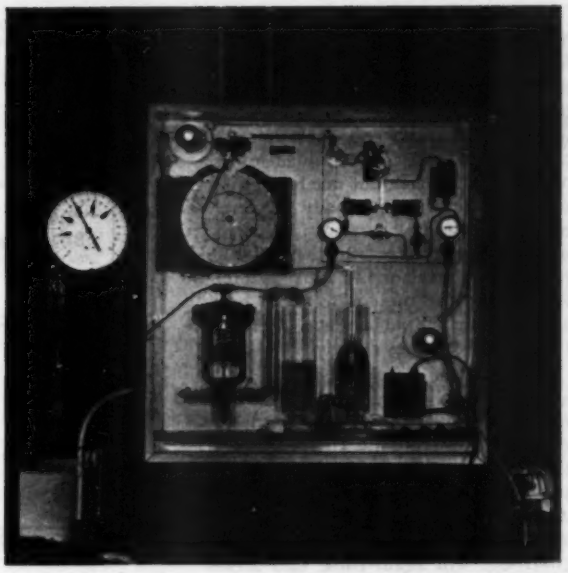

Fig. 4—Opposing pressure loaded bellows replace loading spring to provide automatic reset action

Demonstrated With Working Model

valve is fully open. For any other position of the pen, the output pressure will become a corresponding and proportional value (Table 1).

The process on the panel (Figure 2) will now be placed in operation. By setting the loading valves at 50 per cent load, the controller will create an output pressure of 9 psi to open the control valve to its 50 per cent flow rate. The process will thus attain a condition of stable control and remain there as long as the load does not change. If we increase the load to the 75 per cent value, the level in the tank will drop, the pen will move to 75 on the chart, the baffle will assume a new position and we will find the output pressure registering 12 psi causing the valve to reach its 75 per cent flow value.

Process is again at balance, *but not at the desired control point of 50 on the chart.* Thus it is demonstrated that any proportional type controller will follow the same pattern; that is, to correct for a change in load on the process, the measured level must rise or fall to provide corrective action to the control valve.

While this unit may appear little better than the simple float valve, it should be recalled that it was desired to operate large valves from small impulses generated by a bourdon spring or similar device. This controller unit not only fulfills those requirements but allows for far greater adjustability than did the mechanical leverage of the float valve. A new control point can readily be established by merely moving the set pointer of the controller (Figure 1). The throttling range or sensitivity of the instrument can be easily altered by moving the link S to a new position on the arm T.

To demonstrate the usefulness of the latter adjustment, let us move the links to its midposition. The pen now traverses only 50 per cent of the chart to produce the full output change of 3 to 15 psi. To reduce the amount of offset with a change in load on a process we may wish to reduce the throttling range to the very minimum on the instrument, such as placing link S in its uppermost position to produce 6 per cent throttling.

If the process has favorable control characteristics, this setting may overcome the difficulties of offset since a slight motion of the pen is ample to reposition the valve to a new flow rate. If the process is of a more difficult type such narrow throttling will be undesirable.

Using a throttling range of 6 per cent, the controller will be placed in operation. Control is unstable and the chart record is similar to performance of the on-off controller. As an experiment, let us transfer this controller to another process having a greater tank capacity (Figure 3) by adding a second tank to the system. The process soon reaches a condition of stable control. It becomes evident that the process characteristics, such as capacity, are governing factors in the proper adjustment of the controller.

The double tank system shown on the panel is representative of a relatively easy process to control since no time lags are present. A difficult process would require careful adjustment of the instrument to attain stability.

Time Lags

Assume that the left hand tank represents the heat inflow or steam input to an air heating coil. Flow of water from the tank represents the heat flowing through the wall of the coil. Imposing a restriction to the flow of water from the tank simulates the resistance to the flow of heat through the pipe wall, known as thermal lag. To provide such restriction, a small hole has been drilled in the gate of the valve in the discharge pipe. As the valve is set in its closed position, the flow of water will be restricted to the small opening, thereby producing the effect of time lag in the passage of heat from the steam side to the air side of the coil. The right hand tank represents the temperature level of the surrounding air, and it is this level we wish to control.

Closing the gate valve introduces a time lag in the system; the level in the left hand tank will begin to rise since the restriction has temporarily throttled back on the flow from the tank. In terms of the steam coil operation, we can now visualize the continued inflow of steam to the coil, but due to thermal resistance, the heat is slowly delivered to the surrounding air. With continued addition of steam to the coil, the temperature level of the air rises sufficiently to cause the controller to fully shut off the output air and the controlling valve closes rapidly.

Level in the left hand tank is still abnormally high and because of the time lag, it recedes very slowly. Excess water in the tank corresponds to the stored heat in the walls of a heating coil when it has been supplied with an excessive amount of steam. As the air temperature gradually recedes, the controller will again come into action to supply 15 psi air to the valve and cause it to reopen. The cycle will then repeat, since the valve tends to overshoot the desired flow rate necessary for stabilization of the process.

Offset Increased

Increasing the throttling range also increases the amount of offset experienced with a load change. Before attempting the design of auxiliary devices for such automatic compensation, let us investigate the operation of a proportional controller having 100 per cent throttling range when subjected to a load change.

Making the necessary adjustments on the controller, the loading valves will now be set for a 50 per cent load. Output pressures settles out at 9 psi and and the process reaches a condition of stable control. With an output pressure of 9 psi, lever T (Figure 1) is in its midposition of travel since the movement of the bellows and spring mechanism is proportional over a range of 3 to 15 psi output pressure. Whenever the pen is at the midpoint of the chart, the baffle will be at its midpoint of travel, the output will be at the midpoint of its range, consequently lever T will be at its midpoint of travel, thus causing the nozzle to be correctly positioned in relation to the baffle. With a change in the position of the pen arm, all the foregoing parts will move in proportion to the magnitude of the change.

Load on the process will now be changed to 75 per cent, causing the float to drop, the pen arm to move up scale, and as the controller mechanism gradually reaches a new point of balance, the output pressure reaches 12 psi. The control valve now passes a flow equivalent to the 75 per cent load and the process is again in balance.

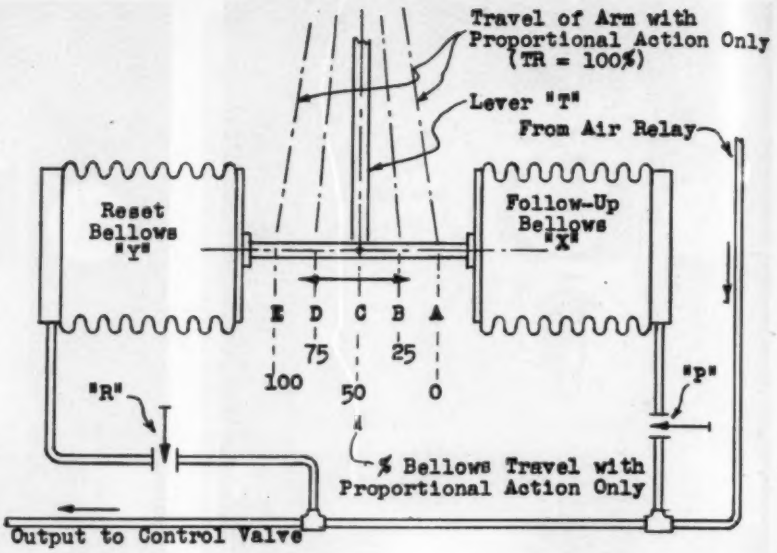

Fig. 5—Both proportioning and reset actions result from use of two opposing bellows connected to the nozzle adjustment arm

Please note that lever T has been advanced to the left and now occupies a position corresponding to 75 per cent of its total travel.

Seeking to return to its original control point and still maintain balance under the 75 per cent load, we must first analyze the condition of the process. Level in the tank is below the desired control point, and to restore the original level, the valve must be further opened to admit an additional amount of water. By disturbing the nozzle baffle clearance the amplifying action of the relay will produce the desired increase in output. To cause such disturbance, bellows X will now be manually compressed to return lever T to its original midposition. As this change is made, the output pressure immediately increases, the controlling valve opens, and the tank level rises to its original position. The pen arm has now returned to the desired control point.

Such manual manipulation of the bellows is but a temporary means to restore the control point, but the principle demonstrated in the repositioning of lever T prompts us to design a mechanism to replace the manual operation with a fully automatic device.

Recalling that the repositioning of lever T required an external force applied to the bellows and spring unit in a direction to further oppose the action of the bellows, and that the load change experienced caused an increase in output from 9 to 12 psi, then an auxiliary bellows, so placed to oppose bellows X, would supply the needed external force if the 3 psi change was utilized as the restoring power. Before installing the second bellows as an auxiliary to the spring, let us investigate the use of a bellows to replace the spring entirely.

Referring to Figure 5, bellows Y has replaced the spring and serves to oppose the action of bellows X. If bellows Y is to furnish an opposing force equal to the spring and thus preserve the proportioning action, it would be well to investigate its behavior if a given amount of air were entrapped within it. As a starting point, let us choose the normal output pressure of 9 psi required by the controller to maintain stable control at 50 per cent load. We will, therefore, charge the bellows with an air pressure of 9 psi and by closing valve R, the air will be entrapped within the bellows.

By making a suitable adjustment of link S to compensate for a slight variation in spring constant between the spring and inflated bellows, the controller will now be found to reproduce the 100 per cent proportioning action obtained with the spring opposed bellows (Figure 4). This action can be checked by moving the pen arm across the chart and observing the proportional change of the output pressure.

Automatic Reset

After the process reaches stable control at a load of 50 per cent, the load is increased to 75 per cent. As the pen arm moves to 75 on the chart, the output pressure will gradually reach 12 psi and it will be seen that lever T has been moved to the 75 per cent position of travel. It is now desired to return lever T to its midposition and thereby upset the nozzle-baffle relationship to cause a rebalancing of the system. By opening valve R, we can admit output air at 12 psi into bellows X and,

due to the increase in pressure within the bellows, force lever T to return to its midposition. It should be noted at this point that both bellows Y and X are charged with 12 psi pressure and reach a position of equilibrium just as they were when equally charged with 9 psi pressure. In both cases, lever T would occupy its midposition of travel. Table 2 shows the stepwise reset action just described.

The process has rebalanced during this procedure and the pen arm has returned to the control point. As we observe the action of the process, the controller appears to no longer provide smooth and stable control but behaves in the manner of an on-off controller. The process has fallen into a cyclic state and the pen arm continues to surge first above and then below the desired control point.

Reason for the on-off behavior becomes obvious as we investigate the functioning of the opposing bellows. With valve R fully open, both bellows receive an equal impulse from the output line, consequently there is no motion imparted to lever T to cause proportioning or follow-up action of the nozzle. Since the nozzle remains stationary, the slightest movement of the baffle will cause a rapid change of output pressure.

This action is identical to the on-off controller. To achieve automatic reset, yet preserve stability in the controller, we will find it necessary to throttle valve R to allow the air to slowly bleed into bellows T whenever a change in load is experienced. In this manner, the proportioning action of bellows X can be retained since any change in load causing a movement of the baffle will immediately produce a change in output pressure, and bellows X will reposition the nozzle accordingly. As the air slowly bleeds into bellows X, lever T is gradually forced to return to its original position preceding the load shift.

In demonstrating this action (Figure 4), valve R will first be set to gradually admit air to bellows X. In actual practice, this rate of bleed is governed by the stability of the process otherwise a cyclic condition may be experienced. This adjustment then becomes the second knob in the instrument and a dial would be provided to indicate the rate of reset.

By imposing a 50 per cent load on the demonstration process, the pen arm levels out at the 50 mark on the chart and continues to hold at that point. The load will now be changed to 75 per cent. The pen swings to approximately twenty chart units to the right of the control band, stops, and as the reset action continues to function, slowly returns to the control point. The controller has thus compensated for a load change. If the load is now returned to the 50 per cent value the pen arm will swing to about twenty chart units to the left of the control band, then slowly return to its original position.

TABLE 1—Controller Operation with Link Set for Throttling Range of 100%

Pen Position on Chart	Baffle & Bellows Position	Output and Bellows Pressure	Valve Opening (per cent)
0	A	3	0
25	B	6	25
50	C	9	50
75	D	12	75
100	E	15	100

Note: For every pen position, there is a corresponding position for the nozzle and baffle, a corresponding output pressure, and a corresponding opening of the control valve.

While the controller is now equipped to compensate for load changes, the speed of recovery is too slow. Increasing the rate of reset may help in some cases, but for other processes it will be found that a higher reset rate may result in unstable control. An auxiliary device is needed to increase the speed of recovery without impairing the reset or proportional action of the instrument.

Reviewing the action of the on-off controller we find that any slight motion transmitted to the baffle by the pen arm causes a rapid change of output pressure to the control valve. Due to the lack of follow-up action by the nozzle, a minute movement of the baffle causes an instantaneous change in nozzle back pressure. If this action could be incorporated in the proportional system, the response rate could be greatly accelerated.

It is evident that the nozzle follow-up action cannot be entirely eliminated if proportional response is to be retained. However, by momentarily interrupting the follow-up action of the nozzle as the baffle assumes a new position, the output from the controller would momentarily change at a rapid rate. If follow-up action could then be restored, the instrument would again perform as a proportional controller.

Recalling that follow-up action is produced by the air pressure impulse delivered to bellows X, the desired momentary interruption of follow-up action could be achieved by restricting the air flow to the bellows. By installing needle valve P in the air line feeding bellows X (Figure 5), flow to the bellows will be restricted in accordance with the setting of the needle valve.

The controller will now operate thus: a slight disturbance of the pen arm will cause the baffle to change position in relation to the nozzle, and thus generate a rapid change in output pressure. Since the flow of air to bellows X is restricted by the needle valve, the proportional action of bellows X is greatly retarded, and this retardation allows the output pressure to increase or decrease at a rapid rate. Such acceleration will provide the increased rate of controller response we have been seeking. The term *rate response* is generally applied to such controller action. It is evident that as the air continues to bleed through needle valve P, the proportioning bellows will eventually cause the nozzle to assume

TABLE 2—Action of Reset Bellows

	Per cent Load	Pressure at Y (psi)	Position Lever T	Pressure at X (psi)
Proportional Action Only (TR = 100%)				
1. Bellows Y charged with air at 9 psi. Valve R closed	50	9	C	9
2. Load increased to 75%	75	9+	D	12
Addition of Reset Action				
3. Valve R opened to admit output air (12 psi) to bellows Y.	75	12	C	12+
4. Process reaches new balance and original control point is restored.	75	12	C	12

Note: In actual practice, valve R is partially opened to provide reset action at a rate consistent with the stability of the process.

its correct position in relation to the baffle and thus preserve the proportional action of the controller.

This response can be utilized by partially closing needle valve P and repeating the load change previously shown with proportional plus reset response. The load on the process will be set at 50 per cent, the throttling range of the instrument will remain set at 100 per cent, and the reset rate will be slightly increased by further opening needle valve R. The three adjustments we have just made; namely, rate response, throttling range, and reset rate, would be set in accordance with the stability of the process.

By increasing the load on the system to 75 per cent, the pen arm swings four or five chart units away from the control band and quickly returns. Decreasing the load to 50 per cent the pen arm deviates only several chart units from the desired control point and returns rapidly. Comparing this action to that of reset response only, the deviation from the control band has been reduced from twenty chart units to approximately five and the recovery time has been reduced considerably.

This test shows an accelerated recovery following an instantaneous load change of from 50 to 75 per cent. The majority of processes do not receive such an abrupt upset in actual practice. It is more likely that the load change will occur at a far slower rate such as that attending the transfer of heat through an interchanger, the gradual warming up of a heated space or other similar processes. Rate response will assist greatly in the stabilization of control in such cases since its function is to cause the controller output to lead the response rate of the process.

That is, if the pen arm were to move at a fixed rate away from the desired control point and the flow of air to bellows X (Figure 1) was restricted by needle valve P, the rate of follow-up motion would be retarded, the nozzle would be displaced from its normal relationship with the baffle, consequently, the output pressure would be accelerated in relation to pen arm motion. The accelerated output thus obtained will be found of great value in offsetting the ill effects caused by time lag in the process and measuring element.

The instrument is now fully equipped with the three adjustable responses. Every well-known pneumatic controller on the market today contains similar elements and operates on identical basic principles, but each manufacturer has selected a slightly different mechanism for making the adjustments.

The mechanism to adjust throttling range may be a very simple arrangement of pivots and levers or again it may be a complicated assembly. The

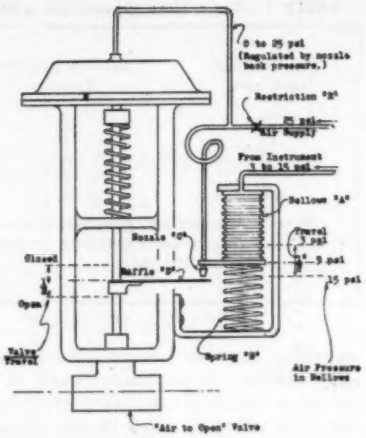

Fig. 6—Valve positioner consists of a nozzle baffle system mounted on valve

reset action may be accomplished by opposing bellows or by the use of a single bellows with the opposing pressures applied to opposite sides of the bellows. The restriction of flow to the bellows may be accomplished by special needle valves, restricting tubes, or a unit consisting of variable passageways.

Valve Positioner

To improve valve performance the next step would be to design a mechanism that would detect improper location of the valve stem and provide corrective action.

As the diaphragm pressure is increased from 3 to 15 psi, the travel of the valve stem will be one-half inch. If an accuracy of one per cent is required, the stem must be located within 0.005 inches of the desired setting. Such close adjustment will require a sensitive feeler device to detect variations of this magnitude. Recalling the previous use of a nozzle-baffle system in detecting minute changes, we shall proceed to utilize that scheme to act as the feeler for our design of a valve positioner.

Turning to Figure 6 we find the basic design for a valve positioner. Mounted on the right of the valve frame is a unit consisting of bellows A opposed by a range spring B. This assembly is a duplicate of the follow-up unit used in the proportional controller and is so designed that a change of air pressure from 3 to 15 psi will cause the bellows to expand one-half inch. A nozzle, marked C is attached to a plate mounted between the bellows and spring. As the bellows expands or contracts, the plate and nozzle will move to a position proportional to the air pressure within the bellows. An air supply connection, shown at the upper right in the sketch, feeds air to a restriction R and thence to the nozzle through a length of flexible tubing. A branch from the nozzle line is connected to the top of the diaphragm motor.

This same scheme was used in the on-off controller and was capable of detecting a baffle movement measured in thousandths of an inch. In order that the position of the valve stem may become a function of nozzle position, a baffle D is shown mounted on a collar attached to the valve stem. Once the baffle is adjusted to a definite clearance with the nozzle, any motion of the nozzle will cause a change in back pressure and thereby increase or decrease the air pressure transmitted to the diaphragm top.

Assume that the controller supplies an impulse of 9 psi to bellows A and that the correct position of the valve stem for this pressure is midstroke. As the nozzle assumes the new position dictated by the bellows, the baffle will then be manually adjusted by sliding the collar on the stem until the baffle restricts the nozzle outflow sufficiently to create a 9 psi back pressure. As the diaphragm receives this impulse it will move the valve stem downward to the midpoint of travel. The baffle support collar should then be locked into a permanent location on the valve since the mechanism is now in proper alignment.

If the impulse from the controller changes to 10 psi, then bellows A will expand, bringing the nozzle closer to the baffle, and thus cause an increase in back pressure. In turn, this increase will move the valve stem downward causing the baffle to be retracted from the nozzle. As the pressure in the bellows reached 10 psi we shall find that the bellows has moved through a distance proportional to the air pressure change and, because of the nozzle-baffle action just described, the valve stem has likewise moved an equal amount. Should friction in the valve prevent free movement of the stem, the baffle would temporarily be retarded in its movement, the nozzle would continue to approach the baffle and the resulting increase in back pressure would act on the diaphragm top until there was sufficient force to overcome friction. It should be noted that if the nozzle continued to move downward until it touched the baffle, a back pressure of 25 psi would be generated. This pressure should be ample to move the most obstinate of valves, providing the stuffing box is not corroded to the point of freezing the stem in a locked position.

As a further example, let us assume that the controller impulse returns to 9 psi, thus demanding that the valve be returned to its original position. The decrease in pressure will cause bellows A to contract and the nozzle will be withdrawn from the baffle. The back pressure will thereupon be decreased, the diaphragm top will be deflated and

the return spring in the valve will force the valve stem to rise. The baffle will be moved upward to re-establish clearance with the nozzle in the same manner of follow-up that occurred during the previous step showing an increase of impulse pressure. Should friction retard the movement of the stem during this operation, the baffle would momentarily remain fixed while the nozzle continued to move upward, the back pressure would continue to decrease until the full force of the return spring would become available to overcome friction. The valve stem subsequently would be returned to its midpoint of travel corresponding to 9 psi controller impulse.

It has been demonstrated previously that a change in nozzle-baffle clearance measured in thousandths of an inch can cause back pressure changes in the order of 3 to 15 psi. It becomes apparent that the positioning device just described will be capable of locating the valve stem within the tolerance required of the valve in Figure 6, that of 0.005 inches. By installing a unit of this type on a valve, the performance of the valve can be improved to match the accuracy of controlling instrument.

Acknowledgment is made to J. H. Kowalski for his assistance in building the demonstration panel and to R. L. Clarke, F. C. Kiesling, N. F. Koenig, E. W. Jensen, R. C. Mack, and Miss D. E. Warren for their help and cooperation in preparing the lecture-demonstration.

Glycerine's Role *in Paper Progress*

MILTON A. LESSER

▸▸▸ PAPER TECHNICIANS probably will agree that the most important recent advances in their craft relate to pliability and endurance. Many of the improvements in this field depend upon the use of that versatile trihydric alcohol, glycerine.

Many workers in the industry seem to be under the impression that the plasticizing action of glycerine is due primarily to its humectant power. But those who have made a study of the matter believe that glycerine has a very definite plasticizing action of its own and that the water which it absorbs from the air should be considered only as an auxiliary plasticizer which is of minor importance at lower humidities.

Many paper sizing compounds are benefited by the inclusion of glycerine. For example, it improves the folding endurance of glue-sized papers. In a foreign process (*1*) for treating paper and cardboard so as to make them more suitable for decorative and protective purposes the materials which previously have been treated mechanically to produce creases, are passed at 50° C. for 10 to 15 minutes through a solution consisting of:

Glue	60- 70 parts
Glycerine	20 parts
Water	200 parts

After drying at 20 C, the glue is fixed by a bath of 9 parts 40 per cent formaldehyde in 300 parts of water or by a bath consisting of an aqueous solution of potassium dichromate. This treatment imparts a veneer-like appearance, yielding products that can be used for wallpapering, suitcase-covering, and for other purposes.

Makes Glassine Flexible

Glycerine is extensively employed in the production of glassine papers to insure retention of flexibility in the finished sheet. Hence, as new materials are adapted for imparting desirable characteristics to such papers, it continues to play the role of a valued adjunct. This has occurred, for instance, in the case of polyvinyl alcohol ("Elvanol" duPont). Glassine paper sized with polyvinyl alcohol is characterized by improved strength, transparency, gloss, grease-resistance and dimensional stability. If a soft paper is desired, some glycerine is used. It has been suggested (2) that, since the combination of polyvinyl alcohol and glycerine may cause slipping of the size press rolls, it may be necessary to put the glycerine in the dampening water instead of the size solution. Good results, so it is said, have been obtained with polyvinyl alcohol, low viscosity oxidized cornstarch, invert sugar, and glycerine.

Glycerine may also be used as a plasticizing agent with other materials being employed as coating or impregnating agents. One such is the corn protein known as zein, which is finding growing utility in the paper industry. As noted by Aiken, (*3*) zein preparations are being used as label coatings and in the manufacture of decorative papers, greaseproof food wrappings and anticorrosion wrappings.

The manner in which glycerine may be used to plasticize zein dispersions are well indicated in Stewart's (*4*) patent claims. The following compound, for example, gives a tough, flexible and grease-resisting coating when solidified by evaporation:

Zein	15 parts
Butyl or ethyl alcohol	20 "
Tall oil	10 "
Ammonium hydroxide	1 "
Urea	5 "
Glycerine	3 "
Water	50 "

The plasticizing and other properties of glycerine are frequently called into use in the formulation of specialized treatments for paper products. Illustrations of such utility are offered in compositions based on amine phosphates; these preparations serving to inhibit the corrosive action of greaseproof paper upon steel or other metals. The phosphates may be used, for instance, in laminated, glycerine-plasticized, greaseproof papers. Thus in a 40-pound greaseproof and 30-pound kraft paper laminate (microcrystalline wax), the greaseproof side is impregnated with 8 pounds of a solution containing:

Glycerine	50.0	per cent
Diamylamine phosphate	0.5	" "
Water	49.5	" "

A laminant for greaseproof and kraft paper contains:

Starch	44	per cent
Glycerine	44	" "
Diamylamine phosphate	12	" "

It is claimed that the laminate made with this composition shows no tendency to separate in contact with oil, and that these sheets show a stable pH over wide variations of climatic conditions and upon aging.

Plasticizer for Coatings

Glycerine's value as a plasticizer is also well indicated in liner coating compositions (*5*) for coating fibrous packaging materials to prevent adherence of the contents to the container. For instance, a coating composition for use with paper bags, cartons and the like is made from:

Fine talc	1,600	lb.
Kaolin	400	lb.
Protein	220	lb.
Caustic soda	11	lb.
Glycerine	3	gal.
Water	380	gal.

More specific perhaps is the following composition for use in packaging asphalt:

Fine talc	1,000	lb.
Bentonite	220	lb.
Glycerine	6	gal.
Water	275	gal.

The growing utilization of glyoxal in the treatment of paper has also called upon glycerine's plasticizing and softening action. As pointed out by Field, (*6*) glyoxal is a highly reactive substance which is considered useful for most of the applications for formaldehyde, especially those dealing with the insolubilization of polyhydroxl compounds and proteins such as casein and animal glues. In many cases, its relative nonvolatility and mild odor permit safer and more pleasant operating conditions than can be obtained when formaldehyde is used.

In discussing the uses of glyoxal, this authority notes that a most promising application for this substance is its reaction with cellulosic materials in the production of paper toweling and cleansing or toilet tissue to increase wet strength. He cites the data obtained when paper towels were treated with a preparation containing:

Hydroxyethyl cellulose	100	parts
Glycerine	100	"
Glyoxal	40	"

In addition to markedly improving the wet strength of paper toweling, Field reports that paper sized with a hydroxyethyl cellulose - glycerine - glyoxal coating can be made resistant to the penetration of printing inks, varnishes, lacquers, lubricating oils, and most solvents. Because this treatment prevents wicking of such materials into paper, it is particularly advantageous for producing extremely glossy and spot-resistant finishes and for decreasing the amount of ink that need be applied to the paper surfaces. Fiber containers and greaseproof paper tubes lined with such a coating have held lubricating oil, ethylene dichloride, and other solvents for two years without leaking. Such containers have also proved to be of great value for the packaging of coffee and other aromatic substances.

Further details are offered in Broderick's (*7*) patent specifications. He describes the usefulness of similar compositions for impregnating paper towels and tissue papers to impart wet strength and prevent linting. An example of an impregnating solution for paper towels is given as follows:

Hydroxyethyl cellulose	4.85	parts
Glycerine	4.85	"
Glyoxal	1.94	"
Water	988.50	"

Synthetic alkyd resins are finding increasing use in preparations for imparting special finishes to paper and paper products. Considerable quantities of glycerine go into the manufacture of this alkyd resin. The greater proportion of the alkyd resins are produced today by the condensation of glycerine and phthalic anhydride modified with drying oils such as linseed, soya, chinawood, perilla, oiticica and nondrying oils such as castor and cocoanut.

These resins find their greatest use in the production of protective and decorative coatings for many types of surfaces. So superior are their characteristics that they now hold the dominant position among synthetic resins used in surface coatings. Since alkyd resins can be modified by various means they have been adapted to the needs of the paper industry.

As noted by Aiken, (*3*) plastic or resinous coatings are applied to papers for both functional and decorative effects; a given coating being used for one or several of the properties it may possess. Similarly, Buttle (*8*) has remarked that by the application of the proper lacquer it is possible to attain such characteristics as moistureproofness, greaseproofness, heat sealability, and gloss for sales appeal. He points out, too, that the word "lacquer," formerly used solely to denote the nitrocellulose coatings, has been broadened by recent usage to denote all films formed by solvent evaporation.

Evaluations have been made of the properties of the alkyd resins, as a general group, with respect to their value as lacquers on paper and other packaging materials. Gray, (*9*) for instance, has prepared some average property ratings of film-forming coating materials. When listing the properties that are of primary importance he gives a rating of "good" for the alkyds with respect to: flexibility, absence of odor and flavor, adhesion to base material, color (water whiteness), water-vapor transmission, nonblocking, abrasion and scuff resistance, and oil or grease resistance.

Also of interest are Buttle's ratings of the relative characteristics of resins for use on paper, especially papers for packaging purposes. Considering them as a general group or type, he gives alkyd resins the following grades with respect to their resistance to various materials and certain other characteristics:

Water	Fair
Water vapor	Good
Acid	Fair
Alkali	Fair
Alcohol	Fair
Gasoline	Good
Oil	Good
Flammability	Fair
Heat	Good
Cold	Fair
Sunlight	Good
Wear	Good
Abrasion	Good
Heat-seal	Poor
Flexibility	Good
Adhesion	Good
Gloss	Good
Color	Good
Odor	Good

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(Continued from page 1747)

making of paper. However, some of the ills more-or-less common to early youth may be experienced—a bevel gear may need to have its teeth attended to—and unlooked-for difficulties may appear, the cure for which is not readily determined.

At this juncture, Doctor Maintenance, the industrial General Practitioner, is called in. He diagnoses the case, and recommends treatment, and refers the matter to the appropriate representative, be he machinist, millwright, piper or electrician. If the "doctor's" recommendations are carried out with sufficient skill, the patient is soon back in place, working quietly and at full efficiency.

However, it may be that due to its novelty or its evident complexity, Doctor Maintenance may desire to call for a consultation on the case, and accordingly Professors Chemistry, Physics, and/or Ultra Spectrum Ray may be brought in, each contributing his technique toward solution of the problem. When agreement is reached, Doctor Maintenance takes control again, and arranges that the treatment which by agreement is declared to be the correct one, is carried out.

Departing now from the figurative aspect of maintenance problems, and giving attention to the facilities of the Statistical, Storeskeeping and other agencies mentioned in a preceding paragraph, the importance of Statistics, in developing a much-to-be-desired program of *Preventive* Maintenance can hardly be overstressed. It is true that at the inception of a well-planned system of records it can contribute little of value, as a history of troubles previously experienced is not available, and only the personal recollections of past difficulties can be invoked as a guide, to point to probable difficulties to come; these being matters of memory only, cannot be relied upon. However, a start must be made somewhere, and it will not be too long before facts will be revealed which, as they accumulate, will be of inestimable value in building a program for the preventive approach so much to be desired. Complete and absolute success in entirely eliminating breakdowns, extra-hour repairs and lost production cannot, of course, be achieved to perfection, materials and required services being what they are, but nevertheless real progress will be made toward lowered costs by even a fractional increase in the efficiency of anticipating troubles which sooner or later are bound to occur.

In the use of what may be termed Advanced or Preventive Maintenance, it is worth while to consider what often happens without such planned procedure. Suppose, for example, that a vital apparatus in the production train is stalled because of the failure of some small but essential part and that this "accident" happens at two o'clock on a Tuesday morning. Everything contributory to or later in the process dependent upon the operation of the apparatus concerned, has stopped; and no paper is going onto the reel. In this emergency the Night Super sends a message to a repair foreman, home and in bed, and describes in a general way what has happened. The foreman then routs out the necessary millwrights, machinists and/or other mechanics and all eventually arrive at the mill. After some discussion (all at so much per hour, including call-allowance and time-and-a-half or double-time) it is decided to replace a worn pinion in the apparatus—but a trip to the storehouse discloses that the last spare has already been used on a companion machine, and that one must now be purchased or made up for the purpose. This brings a call for the Boss Machinist who, if lucky enough to find a suitable blank, will send for the operator of the proper machine-tool, and work on the replacing pinion will begin.

Planning Neglect Results in Accidents

Without elaborating further, it is evident that, in the above case, many productive machine-hours have been lost, premium-carrying time of mechanics has been expended, and a job of doubtful accuracy has been done, because of the pressure for haste.

It will be noted that in the foregoing imaginary case, the source of the difficulty was a *worn* pinion—not one with a concealed flaw. Under the circumstances, regular inspection, under a system of preventive maintenance would have revealed the need for a replacement, which could have been made on a Sunday shutdown as a more favorable opportunity to avoid production-loss, or possibly at a time when conditions necessitated a general stoppage for some other and less-easily-anticipated reason. In the latter case, the superfluous expense of overtime and call-allowance would be avoided. On the paper machine, minor repairs or replacements can often be made while a wire is being changed, and on machines of the older type without removable fourdriniers this time afforded for repair work is appreciable. Other similar shutdowns will inevitably occur, however well the general program of anticipation is planned and carried out, and can be utilized in that same way.

The first step in planning for Preventive Maintenance is to identify each piece of apparatus in the plant by a number ("dog-tag") placed upon it in such an obvious way that it can be easily referred to—in the Maintenance office is a list of these numbers, with the name and/or function of the apparatus to which each applies. It is customary to use a simple code in allotting numbers, thus avoiding confusion as well as providing extra space for additional apparatus, or for later subdivisions if found desirable. Thus 1-1—2 would represent (reading from the last number) the "second press on Number One paper machine in the machine room," and 1—2-2 would indicate a similar press on Number Two machine. These numbers with dashes as shown would be printed on a metal tag fastened to the apparatus in an easily-seen position. In the maintenance office, a master list would be on file, and a card or loose-leaf system would be prepared to receive the records of the work as done on each piece of apparatus in the plant.

Figures for cost of the work done on each job are based on a job-card, made out in each case by the maintenance office and approved for engagement before starting.

The job-card bears the code number of the machine on which the work is to be done, a serial number for later tracing, a brief description of the work, the name of the individual making the request and the initials of the person approving it. It also provides space where the totals for labor and material are entered on a weekly basis, debits by the storehouse being accumulated for that purpose, and labor figures from the time office records. If desired, the storehouse charge-slips may be clipped together, filed with the job-card and kept for a reasonable time, after which the slips may be destroyed. The job-cards, when the job is completed, are filed for the future, so that they may be examined at any time, over several years, at least.

The job file is in three parts: (1) requested, (2) in process, and (3) completed, and the job-card is moved from one section to another, in that order.

As a guide for future consideration of the cost of maintenance of individual pieces of apparatus it is essential that information is at hand to show what work has been required to be done, over a period of time, to the end that the apparatus was kept in operating condition. Without such guidance, a minor repair, which does not go to the seat of the trouble may frequently be repeated over and over again, to no permanent gain. An instance is re-

called where, in a large mill, a tail-sheave on a wire rope car-pull was replaced eight times in one year, before redesign and a change in operating conditions brought about more efficient performance. In another case, a new type of stock-thickener broke shaft after shaft, until the repetition of requisitions brought home to the Purchasing Agent that something basic was at fault. As a result of his efforts the manufacturer of the device resurveyed the principles on which it was designed, discovered that they were based on error, took back the machine and returned to the purchaser the price paid—some $15,000.

Both of the typical cases cited above were caught by the purchasing agent because of his recollection of past events over a relatively short period of time, his practical knowledge of mill operations, and his initiative in following each case through to a conclusion. As against these two cases, there were undoubtedly other questionable requisitions, which he either overlooked or was unqualified to contest. It is the purpose therefore of the maintenance record to bring such repetitive procedures to the attention of the men who are held responsible for repair expense, and who without some such assistance, are less able to "Plan to Avoid," and so must be content to "Plan to Repeat!"

The final maintenance record of money expended and work completed is preferably a card system and is made up from the job cards, and is posted from them as each job is completed, or weekly during its progress. The former method required less clerical effort, but does not give as accurate a picture on jobs of considerable duration, and is not as readily checked against the storehouse and time office records.

At its inception, like all other arrangements for basing the future on past experience, the function of the final maintenance record will serve only as an explanation of "where the money goes." As time elapses, however, it will be increasingly helpful in the battle to "stop the money from going" by showing what expense has been necessary in order to keep the mill equipment in functioning condition, and point to those high cost machines which require closest scrutiny by the head of the department. As an example, the record may show that a certain pump has been frequently repacked,—investigation may indicate that the type of packing used may be the wrong one—or that grit getting into the gland has scored the shaft, etc. Whatever the difficulty may be, the effect of the examination is that the causes of the trouble are first isolated and then removed, and a source of unnecessary expense has thus been sealed off.

The accuracy of the maintenance record depends not only on the work done in the maintenance office itself but (as is sometimes ignored or overlooked) on the working data received from the time office and the storehouse. As the activities of the former are closely patterned on a form of accounting, and deal with hours-of-labor in exchange for dollars, the habit of accuracy is ingrained in its operation, and shows through in its handling of the reports on the labor costs of maintenance.

Storekeeper Can Help in Economy

On the other hand, the reports from the storehouse to the maintenance department are not always as reliable, as it is unfortunately true that Management is sometimes of the opinion that practically anyone can be a good storekeeper—a formidable fallacy. Cases have occurred where, due to the seniority rules in force, a storehouse helper with few, if any, of the necessary qualities is "set up" to the position, and as the character of the operation does not generally lend itself to close limits, the results are apt to be less than perfect.

A good storekeeper must be possessed of certain attributes,—honesty, a sense of order, accuracy, the ability to say "No" on occasion, ability to get along with his customers, his helpers and superiors, and devotion to his work, all are important requirements. A really effective storekeeper can save money for his employer, and his remuneration should reflect that fact.

In many of the larger paper and pulp operations, manipulation of the qualities of materials in the custody of the storekeeper is carried on through an inventory control system, either operated at the storehouse, in the maintenance department or by the purchasing department. Debits and credits to the inventory of the proper items are made from approved invoices against the company in the first case, and from charge slips from the storehouse which indicate withdrawals therefrom. Increases to the stock are based on orders to suppliers, these are in turn being founded on requisitions originating in the inventory control system. The guide to their time of issuance is the important figure of "Reorder Point." When this quantity-on-hand reaches or closely approaches this figure, the requisition for that item is prepared.

As lack of the materials which maintenance uses clearly interferes with its performance, and as the continued availability of such material depends largely on the ability of the purchasing department to provide new supplies, it is essential that the factor of "time-to-secure" in the equation whose "x" is the reorder point sought should be supplied by that agency. As it determines whether the Company's interests are best served by volume shipments from factory or by small lots from nearby dealer's stock, that department is best in position to affect the quantity to be kept on hand, through the manipulation of the reorder point. It should make frequent surveys of the situations as to availability and with the control function re-set the reorder points as advisable. Proper co-operation in this regard is essential—failure to so perform opens the door to either expensive follow-up procedures on the one hand, or to impotence of the Maintenance forces (through lack of material with which to work) on the other.

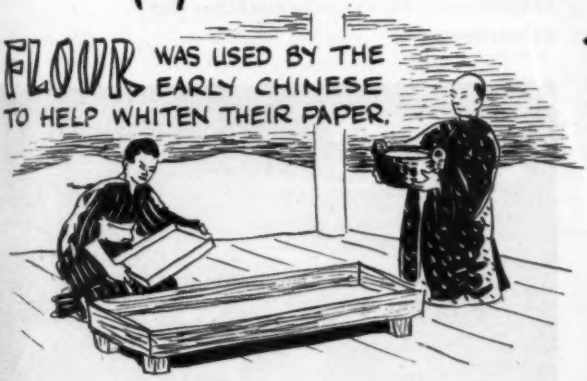
Although there are many causes of impending failure of materials which cannot be discovered while the material continues in use (such as in carbide segregation in chrome steel castings and fabricated piping in sulphite acid systems) there are yet many incipient difficulties which are easily discernible even while the apparatus is in operation, and these listed for correction when it is idle. Chipper bed-knives, screenplates, belt drives, conveyors, valves, pipelines, pumps, etc., frequently show signs of potential trouble before actual failure occurs, and in many such cases breakdown and major losses may be avoided by early repair. "An ounce of prevention is worth more than a pound of cure."

It may be commented that the operators of the apparatus do, as part of their duties, keep a vigilant eye on the condition of the machines, etc., on which they are engaged. While this may be fortunately true in some instances, it is wishful thinking to believe that such procedure is general or that, when indulged in, goes far enough or is early enough. Looking on the dark side, it must be conceded by those of the foregoing opinion that the breakdown of a wood-yard conveyor does not at the same time stop the pay of those who feed it, and that a blockpile in winter is a very cold place!

The results obtained by organized inspection as to its efficiency are easily determined by reference to the reports submitted if a breakdown occurs in a machine which has been passed without suggestion for correction, either the inspector has been negligent or the source of trouble was not reasonably observable,—in neither case was it a fault of the plan. "No system is better than those who carry it out."

PAPER SKETCHES

FLOUR WAS USED BY THE EARLY CHINESE TO HELP WHITEN THEIR PAPER.



Two Men OF TWO GENERATIONS — FATHER AND SON — OPERATED THE WILLCOX PAPER MILL FOR 98 YEARS! FATHER THOMAS BUILT THE MILL ON CHESTER CREEK NEAR PHILADELPHIA IN 1729; SON MARK WAS ACTIVE IN ITS MANAGEMENT UNTIL HIS DEATH IN 1827.

THE USE OF NON-INFLAMMABLE GLASS FIBERS IN CIGARETTE PAPER RECENTLY HAS BEEN PATENTED IN CZECHOSLOVAKIA. BY PREVENTING ASHES FROM DROPPING, THE GLASS FIBER ADMIXTURE HELPS PREVENT FIRES.

To PROTECT BUYERS, THE PAPYRUS MAKERS OF THE ANCIENT WORLD STAMPED EACH SHEET. THIS STAMP GUARANTEED THE VALUE AND AUTHENTICITY OF THE PAPYRUS.

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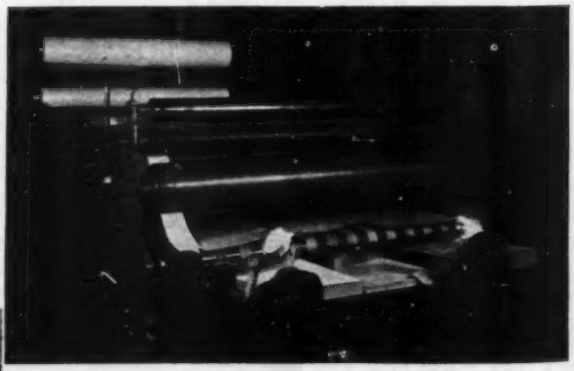
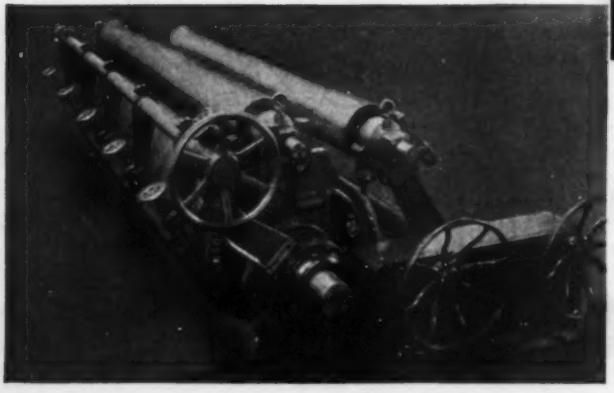
To cut with extreme accuracy at high speeds, regardless of shock, a mill should have either a Black-Clawson triplex or duplex cutter. Also available as a simplex, where preferred.

For an easy-to-handle reel when changing cores, a Black-Clawson Pope type uniform speed reel is recommended. A B-C upright two-drum unit is also a popular reel. On the above and other equipment for the finishing end write Black-Clawson, also for cylinder machines and Fourdriniers.





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Optimism! . . . . . Confidence! . . . . . Judicious Leadership!

Highlight a Memorable PAPER WEEK

▸▸▸ DISBELIEF that any serious recession impends within the paper industry and an undertone of confidence eminated from practically all gatherings during the seventy-second annual convention of the American Paper and Pulp Association at the Waldorf-Astoria Hotel in New York City, the week of February 21.

Highlighting this attitude of industry leaders are the following excerpts from the official addresses of some of the outstanding paper mill executives:

"A balance (between supply and demand) has been approaching for months. So its arrival throughout the whole industry shouldn't be an occasion for panic or undue pessimism," Cola G. Parker, president, Kimberly-Clark Corporation and president, American Paper and Pulp Association.

"There is nothing in the present situation for fears and lamentations. It is filled with challenges and opportunities," R. M. Fowler, president, Canadian Pulp and Paper Association.

"Reviewing the whole situation, and despite the gloom which seems to hover over this part of the country, I am of the belief that when this year is ended we will find that, so far as 'units' are concerned in practically every line of business, the 1949 consumption will equal or exceed that of 1948," D. Clark Everest, president Marathon Corporation, and a former president of the American Paper and Pulp Association.

While the addresses by these speakers were the keynote of all of Paper Week, the same general spirit of optimism prevailed in the meetings of the various divisional groups. In these meetings many of the secretaries presented analyses of the business situation. The least optimistic statements indicated that production in 1949 would not be less than 95 per cent of the 1948 record output, and if there were even this minor drop of 5 per cent in production it is only because the consumer outlets have been making up for lost time by replenishing inventories to normal levels. If this view is correct, the position was stated that actual consumption by the ultimate consumer in 1949 will be equal to that in 1948, and diminution of production, if any, merely will be to the extent that the pipe lines from mill to consumer have been so filled that prompt deliveries are now possible in all lines.

In many respects, the 1949 Paper Week was one of the most successful in many years. While the attendance may not have been as great as in some previous years, the divisional meetings were much more largely attended than usual. In other words, the mill executives who were present were the top flight industry leaders; less attention was paid to conferences with potential customers, and much more intensive study given to the industry problems as discussed in these meetings of special groups. This was noted particularly in the major groups where the addresses by outstanding speakers were heard by more listeners, and by listeners who rank at the top of the industry in their particular fields.

The week was one of work and study —not of routine contact with friends, customers, and suppliers.

Details of the more than fifty separate sessions of groups and working committees are given elsewhere. A brief run-down is not amiss, however. The week began Monday, February 21, with Mr. Everest's address before the Sulphite Paper Manufacturers Association, and the annual meeting of the United States Pulp Producers Association. The latter meeting produced some outstanding reports on the 1948 situation in this basic raw material field, as well as striking forecasts of the future's economic picture. Here, Oliver M. Porter, now in charge of paper and allied industries in the National Security Resources Board told of the preparatory work being done to prepare this nation for war, if that is necessary, but primarily to let the world know that if such a catastrophe occurs, American industry is prepared to meet the challenge.

On Tuesday, Raymond Moley, before the Writing Paper Manufacturers Association, gave a critical review of the manner in which Government at Washington is leaning toward the left. Tuesday, also, was the day for the largest (from the standpoint of attendance) affair of the week, the annual luncheon of the Salesmen's Association of the Paper Industry. Here the speaker was an educator of national renown.

Wednesday was the day for the annual Association banquet, one of the most elaborate in its history, with addresses devoted both to industry and to world affairs.

The annual meeting of the Association on Thursday resulted in practically the entire slate of present officers being reinstated. For another year the Association is headed by Cola Parker as president and Roy K. Ferguson, of

***D. C. EVEREST** delivered two addresses during Paper Week. Speaking before the TAPPI luncheon he said: "No other industry with which I am familiar, has anywhere near the number of scientists, technicians, and technically educated people connected with it, directly and indirectly, as the pulp and paper industry."*

Mr. Everest climaxed his talk before the Sulphite Paper Manufacturers Association with this statement: "Reviewing the whole situation, and despite the gloom which seems to hover over this part of the country, I am still of the belief that when this year is ended, we will find that, so far as 'units' are concerned in practically every line of business, the 1949 consumption will equal or exceed that of 1948."

One of the leaders of the industry, Mr. Everest is president of The Marathon Corporation and board chairman of Marathon Paper Mills of Canada. He is a past president of the American Paper and Pulp Association.

St. Regis Paper Company, as first vice president.

During the week, practically all of the other divisional groups held their annual meetings and these were interspersed with largely attended meetings of those interested in pulpwood production, and the increasingly important section devoted to the maintenance of the industry's forest reserves by the application of the highest type of scientific forestry management.

The main ballroom of the Waldorf-Astoria was filled with guests for the annual banquet of the American Paper and Pulp Association at which addresses were delivered by the presidents of the American and Canadian Associations and by a spokesman for the United Nations.

At the beginning of the speaking program, Cola G. Parker, President of Kimberly-Clark Corporation and President of the American Paper and Pulp Association introduced R. M. Fowler, President of the Canadian Pulp & Paper Association who spoke strongly on the need for the paper industry leaders to give the public a better appreciation of the solid background of the industry. He told of the opportunities of the paper mill executives to demonstrate to the people of the two countries the efficiency of management, and more than that he urged them to prove to the rest of the world that the North American conception of individual enterprise is something that can not be approached by the socialistic conceptions of many other parts of the world. He said it was a challenge which must be met.

Mr. Parker in his annual address expressed every confidence that the United States Paper Industry will fulfill the demand of the public that it produce all that the nation requires, and that the increasing population can not fail to use more paper and use paper in new ways. He said that the results of the presidential election show that the public is making greater demands than had been expected, such as payment of high wages, to provide national defense, as well as aid the rest of the world, and to provide a greater measure of public works and social welfare. If industry is to meet these demands, as it can, he said there should be recognition on the part of the public that there must be fair returns to the owners of business.

On the world economic side of the picture, Louis Dolivet, international editor of the United Nations World, gave a critical survey of the work of the United Nations. He pointed out the accomplishments already achieved, the critical nature of the problems ahead, and in careful language described the difference in the social concepts of the East and the West. While not explicit in his words, he gave the impression that in his belief as an observer at close range, differences can eventually be met. Regardless of the combative language of the Soviet leaders, he said that when such crucial issues arose as that in Iran, Russia had recognized world sentiment as forcing a withdrawal of its forces.

APPA Annual Convention

▶▶▶ CONFIDENCE was the keynote of the 72nd annual convention of the American Paper and Pulp Association and affiliated organizations—confidence in the situation presently existing in the pulp and paper industry and confidence in the prospects for the industry during the coming year. Speaker after speaker at the various meetings held during the five-day convention stressed that all that is needed to insure continued activity and favorable conditions for the industry is a degree of confidence on the part of those within the industry.

The convention, on February 20-24 at the Waldorf-Astoria Hotel in New York, was largely attended. Virtually every paper and pulp mill in the United States, and many in Canada, was represented in the horde of industry members who journeyed to New York to participate in the convention.

Cola G. Parker, president of the Kimberly-Clark Corporation, Neenah, Wis., was re-elected president of the American Paper and Pulp Association at the annual meeting of the Executive Committee and Board of Governors of the APPA held on February 24. This will be Mr. Parker's second year as head of the Association.

R. K. Ferguson, president and chairman of the board of the St. Regis Paper Company, New York City, was again elected Association first vice president, and the following vice presidents were chosen: M. D. Bardeen, president of the Lee Paper Company, Vicksburg, Mich.; D. K. Brown, president of the Neenah Paper Company, Neenah, Wis.; Hugh J. Chisholm, president of the Oxford Paper Company, New York City; F. G. Coburn, president of the Brown Company, New York City; Sydney Ferguson, chairman of the Board of The Mead Corporation, New York City; R. L. Fitts, president of the Southern Advance Bag and Paper Company, Boston, Mass.; J. H. Hinman, president of the International Paper Company, New York City; D. S. Leslie, first vice president of the Hammermill Paper Company, Erie, Pa.; David L. Luke, Jr., president of the West Virginia Pulp and Paper Company, New York City; R. A. McDonald, executive vice president of the Crown-Zellerbach Corporation, San Francisco, Calif.; J. L. Madden, president of the Hollingsworth & Whitney Company, Boston, Mass., and George Olmsted, Jr., president of the S. D. Warren Company, Boston, Mass.

Earl W. Tinker, of New York City, was again elected executive secretary and treasurer of the APPA.

APPA Dinner Meeting

The annual dinner of the APPA held in the Grand Ballroom of the Waldorf-Astoria on Wednesday evening, the 23rd, proved a fitting climax for the very interesting convention. On the dais, at two long tables, were more than two score leaders of the industry, including past presidents of the Association, presidents of numerous paper mills, and Association officers and invited guests.

The Association's president, Cola G. Parker, gave his annual report to the APPA at this luncheon. Another feature was the guest speaker, Louis Dolivet, international editor, *United Nations World*, who spoke on the subject "Industry's Stake in the United Nations." The speaker, who is well known as an author, lecturer, and political economist, made a plea for better understanding of the United Nations and its effect on international trade.

President Parker presided at the luncheon. As MC, he filled his post admirably throughout his introductions of the distinguished guests. One of these guests, R. M. Fowler, president of the Canadian Pulp and Paper Association, spoke informally bringing greetings and good wishes from the paper

manufacturers in his Association. He praised the work that has been done by the APPA during the past year. However, he pointed to the generally accepted fact that while the paper industry on both sides is sound and in good shape, the holiday is over and there is much work to do. Aside from the economic aspects of all business, Mr. Fowler referred to the challenge facing all business—that we should live up to tradition and dispel any suggestion of fear or panic. He closed by saying "We have to win the greatest battle of ideals that has ever been joined in the history of the world."

President Parker's Report

As an industry, our growth, which has been phenomenal for the past decade, continued through the year 1948. Paper and board capacity in the United States which in 1940 was 16,900,000 tons, in 1947 had grown to 21,700,000 tons and, in 1948, to 23¼ million tons. Projected into 1949, paper and board capacity is estimated at 24,325,000 tons. Pulp capacity likewise has kept pace; it jumped from 10,400,000 tons in 1940 to 12,800,000 in 1947, and to over 14,000,000 tons in 1948; with the estimated 1949 capacity just short of the 15,000,000 ton mark. These data indicate a truly phenomenal growth, particularly for an industry as ancient as ours.

In considering the welfare of the paper industry for the year 1948 and for the future, we must recognize that it now occupies such a vital position among the industries of the United States and in our national economy that its welfare and stability should be of concern not only to every citizen but also and particularly, to our Federal and state governments.

It is of outstanding importance that we increasingly remember, what to date is so seldom recognized outside of our industry—that our mill locations are largely in smaller communities (many of which we built and built well) where the livelihood of the whole community is almost wholly ours to provide. In that respect at least, we are almost unique among manufacturing industries.

When we look at the record for 1948, the paper industry has a performance of which to be proud. . . . We find 1948 production exceeded 22 million tons contrasted with 14½ million tons in 1940—more than a 50 per cent increase. Per capita consumption has increased from 254 pounds in 1940 to 358 pounds in 1948. This is quite an item to consider in relation to the tremendous growth in population, between 1940 and 1948, approximating 15 million people, a growth which has not yet stopped. While we have much in this record for which to be grateful, we should be properly humble about it. We cannot rightly claim all the credit; for we must recognize that without the record production and the contribution to our national requirements of Canadian fiber and newsprint, the United States industry and the public requirements for 1948 could not have been met. We should, therefore, insist on giving grateful recognition to the Canadian industry.

Cola G. Parker, who was re-elected president of the APPA

So much for the record of the past. We are, as is usual in any dynamic economy, more concerned with the future than with the past—however great our pride in that past.

Therefore, it seems desirable to mention certain basic considerations as they relate to the year ahead of us. I do so with full recognition that the role of a prophet is thankless, without honor and without *profit* (no pun intended).

E. W. Tinker, Executive Secretary American Paper and Pulp Association

If there had been any doubt about it, a cursory examination of history should have made clear to anyone interested that our industry would bring into being adequate supply to meet any demand at the earliest possible moment. We have never failed to meet demand with supply in the past—so why anyone should have doubted our doing so in the last year or two, is beyond me. However, reaching this balance didn't occur over night. A balance has been approaching for months. So its arrival throughout the whole industry shouldn't be an occasion for panic or undue pessimism.

On the contrary, paper *consumption* (and I am referring to use by the ultimate consumer, and not just *orders* by intermediate handlers of paper and board), is continuing at record levels. It took two years of herculean effort on the part of the industry to bring exhausted inventories up to a normal level. When that level was reached it was certainly possible to conclude that when pipe lines once more were full to overflowing the wise procedure might be to let the fullness subside a little.

In the January Review by the Department of Commerce, it is pointed out that while prices have advanced fairly gradually since 1945 to a high index number of 188.9, this—*and I quote* "was well below the average index for all commodities or for manufactured products." It was also noted that prices of European pulp were not included in the index (though they are part of our costs), and it was stated that if they had been included, the index would have been higher and the average increase greater.

Finally, for what it may be worth—it was stated very unlikely that pulp prices would ever again touch prewar level relationship to paper and board.

After a year as president of the American Paper and Pulp Association, I would like to report to you regarding that organization's service to and representation of the pulp and paper industry. A great many of you know me well enough, I believe, to recognize that as President of the Association I am not content just to believe that its service is worth while, but that I would want to know of any defects in serving the purposes for which it was organized and because of which it is now supported by the industry.

One of the basic functions of the American Paper and Pulp Association is to assure an informed industry. Under any conditions this is a slow and laborious process. I am encouraged to

think that, ranging all the way from rather intricate statistical correlations to labor relations matters, the Association is placing in the hands of its member companies essential basic material. Further than that, I believe that most, if not all, executives in the industry now recognize the desirability, if not the necessity, of reasonable familiarity with factors that influence industry trends and conditions.

Moreover, with the growth in size and importance of the paper industry, the information available in the Association has become an increasingly important factor in obtaining intelligent consideration of the industry's economy on the part not only of industries dependent upon its products, but also of the financial community.

Much time and effort has been directed to a better understanding on the part of the executive branches of the government. Beyond this information of a general and continuing character, the Association has been currently involved, during 1948, in projects that mean much to the industry's general welfare. I have recently reviewed a list of six of these immediate projects, varying all the way from the industry's position and its presentation with respect to increases in freight rates requested by the carriers, which involve many millions of dollars that the industry would be required to absorb, to the effective cooperation of the industry with the National Security Resources Board in its war mobilization planning.

Each one of these projects has required the formulation of a carefully developed plan and the effectuation of that plan. In every case the policies that were followed were approved by the Association's Board of Governors and, as to the general administrative action, by the Executive Committee.

I would like to say two things with regard to the Association's work. First, the Executive Committee and the staff welcomes all constructive criticisms that will improve the Association's effectiveness in the industry's behalf, always within proper legal limits. Second, I recognize very well that in matters involving the general industry welfare, to which the activities of the industry's parent association are confined, it takes good industry citizenship and a degree of statesmanship to maintain appreciation of the importance of these problems and the necessity for the Association's support.

However, I believe that the past 20 years has brought, in the pulp and paper industry, great growth among the executives of the industry in statesmanship and industry-consciousness that assures acceptance of the Association as a working tool vital to the paper and pulp industry's welfare.

CAN. TECHNICAL SECTION BRANCH ELECTS OFFICERS

At the recent annual meeting of the Maritime - Newfoundland branch of the Technical Section of the Canadian Pulp and Paper Association, held in Dalhousie, New Brunswick, George C. Beatteay of Fraser Companies, Ltd., Edmundston, New Brunswick, was named chairman. J. Wing, manager of the Gaspe Sulphite Company, was the retiring chairman. Vice chairman elected was W. S. Hasking, Bathurst, New Brunswick, and J. H. Yorston, Edmundston, became secretary-treasurer.

The meeting was held in the form of a dinner at the Chaleur Club, and the visiting delegates toured the local mill of the New Brunswick International Paper Company.

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▶▶▶ AT THE ANNUAL meeting of the Monorail Manufacturers' Association held in Chicago, A. F. Anjeskey, sales manager of the Cleveland Tramrail Division of The Cleveland Crane & Engineering Company, Wickliffe, Ohio, was elected president; Wilbur Mayer, sales manager of Louden Machinery Company, Fairfield, Iowa, became vice president; and E. Donald Tolles was made secretary-treasurer. The offices of the Association are located at 71 West 35th Street, New York 1, New York.

A. F. Anjeskey

Wilbur Mayer

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NEW OFFICERS ELECTED AT ANNUAL MEETING OF FOREST PRODUCTS RESEARCH SOCIETY

Arthur L. Mottet, of The Long Bell Lumber Company, Longview, Washington, was elected chairman of the Northwest Section of the Forest Products Research Society at the annual meeting of that group held in Longview February 22.

Clarence Stone, of Seattle, was named vice chairman; W. I. West, of Oregon State College, was elected secretary-treasurer, and Dr. O. Harry Schrader, Jr., of the University of Washington, was elected trustee.

Reports on research being carried on by six publicly supported laboratories and research centers took up most of an afternoon session.

The morning session heard about recent studies concerning paint and wood surfaces and how to improve both to get more satisfactory results.

Chapin Collins, Montesano publisher and former director of the American Forest Products Industry, addressed the members who attended the annual banquet.

Research subjects outlined at the afternoon session ranged from the effect of radiant heating on wood floor performance to the strength of second growth Douglas fir.

The group heard of one study being made at the University of Washington, College of Forestry, by a student from India who is trying to extract protein from peanuts to get veneer glue for manufacturing in India.

The Forest Products Research Society was formed two years ago to bring together engineers, chemists, wood technologists and other scientists who have a common interest in forest products research.

Prior to that time there was no organization which cut across all fields of scientific study and brought the various technicians together into one group where they could exchange ideas.

All members of the group are interested in forest products and how to get the most and best out of the timber resources of the nation. All are trying to find new uses for forest products, improve efficiency of present methods and better utilize waste material.

The men who gave reports were: Dr. P. B. Proctor, director of the Oregon Forest Products Laboratory; Dr. Roscoe M. Brown, supervisor of the Forest Products Laboratory of Canada at Vancouver, B. C.; Dr. J. A. Hall, director of the Pacific Northwest Forest and Range Experimental station, Portland; Dr. Bror Grondal, of the Forest Products Laboratory, College of Forestry at the University of Washington.

Dr. James McGinnis, of the College of Agriculture at Washington State College, and Herbert M. Peet, executive secretary of the State of Washington Institute in Seattle.

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▶▶▶ THE FOURTH ANNUAL Industrial Packaging and Materials Handling Exposition will be held this year in Detroit at Convention Hall, October 4th through 7th, The Society of Industrial Packaging and Materials Handling Engineers (national professional group) have announced. This will be the first time since its organization that the show has been held outside of Chicago, and the reason for the change is the increasing number of their members in the automotive field.

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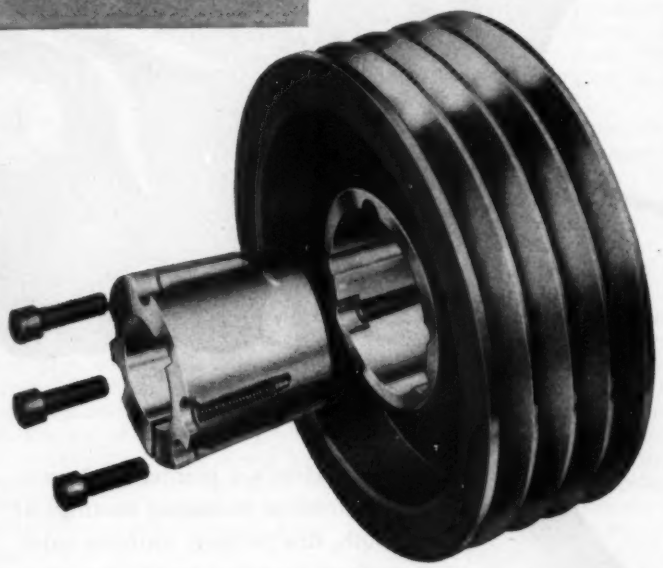
Holds fast to the shaft with firmness equivalent to a shrunk-on fit



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Thirty-fourth Annual TAPPI Meeting

▶▶▶ ONE OF THE MOST successful gatherings in the history of the Technical Association of the Pulp and Paper Industry was its 34th annual meeting, held in New York City February 21-24. Over 1400 registrants crowded the ballroom foyer and meeting rooms of the Hotel Commodore with a sustaining interest in all events. This is a major event for TAPPI members and, as usual, it was highlighted by a number of traditional events that afford a contrast to the well-filled program of technical papers.

This year the TAPPI medal was awarded to Hardy S. Ferguson, consulting engineer and architect, whose achievements are recounted on a subsequent page. Sharing the limelight of the annual luncheon with the TAPPI medal presentation was the address by D. C. Everest, of Marathon Corporation. Actually Mr. Everest already had expressed a keynote of optimism to Paper Week in an earlier address before the Sulphite Manufacturers Association.

His talk before TAPPI, however, touched on some of the problems that constitute bottlenecks to progress of the industry. One of the foremost of these is the depletion of our wood supply. Conservation by elimination of waste in logging is becoming increasingly necessary. Better utilization of raw materials by increasing the variety of wood that can be used for pulp fiber is of foremost importance. The need for more entomologists and pathologists to study the diseases and insects that destroy our forests was pointed out. Mr. Everest expressed confidence that advances in technology would more than overcome the problems now facing the industry.

At the first session of the convention, Albert C. Bachmann, Missisquoi Corporation, Sheldon Springs, Vermont, was named the president of TAPPI for 1949-50, and Kenneth P. Geohegan, Howard Paper Mills, Dayton, Ohio, became first vice president of the organization. Mr. Bachmann succeeds Wilbur F. Gillespie, Gaylord Container Corporation, Bogalusa, Louisiana, who has been president during the past year and a half. Members of the Executive Committee for three-year terms are: James d'A. Clark, Longview, Washington; Martin L. Downs, Thilmany Pulp and Paper Company, Kaukauna, Wisconsin; Werner Kaufman, Kupfer Bros. Company, Chicago, Illinois; George H. Pringle, The Mead Corporation, Chillicothe, Ohio. Karl O. Elderkin, Crossett Paper Mills, Crossett, Arkansas, was elected to serve for one year.

Albert E. Bachmann, who was elected president of TAPPI for the coming year

Annual Report of Secretary Macdonald

In his annual report to the Association, R. G. Macdonald, secretary-treasurer, gave a comprehensive summary of the accomplishments of the past year. The following highlights of his report prove that the progress of the Association is in pace with the times:

Reflecting the times, the Association had an exceedingly successful year in 1948. The membership continued to grow at a rapid rate and several productive conventions were held. The work of the divisions and committees was very good in spite of the tremendous pressure of work on the committee chairmen and members by their companies during a record-breaking new construction and mill improvement year.

Membership

There were 424 individual members elected in 1948, 134 members resigned or were dropped. On December 31, 1948, the totals individual membership was 3557.

There were 8 corporate and 14 sustaining members elected. Eight corporate and 4 sustaining members resigned. The corporate membership on December 31, 1948, was 205, and the sustaining membership was 176.

Special reports issued by the Association in 1948 were: No. 374 Groundwood Mill Equipment Survey II, No. 375 Process Water Used in the Manufacture of Alkaline Pulps, No. 376 Conditioning Cylinder Machine Felts and Wires, No. 377 Broke in the Manufacture of Book Paper, No. 378 Casein Substitutes, No. 379 Casein, No. 380 Use of Fadeometers, No. 381 Pulp Sampling at the Blowpit, No. 382 Groundwood Mill Equipment Survey III, No. 383 Groundwood Mill Equipment Survey IV, No. 384 Use of Weightometers for Wood Chips, and No. 385 Use of Alum Solutions.

Employment

Although a large number of members found new employment through the assistance of the Association, there was neither a great surplus of jobs open or men available. In 1947 there were many more jobs open than there were men to fill them. The slack was apparently taken up by the growing availability of men who were in the Armed Services and, after a brief refresher course in technical schools entered the industry in their old jobs or as newcomers. The large number of the latter

R. G. Macdonald, secretary-treasurer of the Technical Association

was evident in the attendance at national and sectional meetings. The desire of the Association to assist in taking care of employment needs should be kept in mind. This applies in particular to paper mill superintendents, engineers, technically trained men and even mill operating managers, as well as sales engineers for the machinery and commodity industries. The Association does not require any fees for performing these very important services.

The Fall Meetings

Beginning in August the Association conducted six fall meetings, all of a functional nature. Attendance in general was somewhat higher than in 1947.

On August 16-17, the TAPPI Plastics Committee sponsored a meeting at the Institute of Paper Chemistry at Appleton, Wisconsin. E. C. Jahn of the New York State College of Forestry was general chairman.

The lignin round table conducted by the Institute of Paper Chemistry at Appleton in August was followed by a meeting of the Wood Chemistry Committee of the U.N.F.A.O. meeting near Cleveland, Wisconsin, and by the

The annual luncheon of the Technical Association was held in the Grand Ballroom of the Commodore Hotel on Thursday, February 24

TAPPI Fundamental Research meeting at the University of Wisconsin and the Forest Products Laboratory, Madison, Wisconsin. Harry F. Lewis of the Institute of Paper Chemistry was general chairman.

On September 27-29, a meeting was held at Poland Springs, Maine. This was devoted to mechanical pulping and was jointly sponsored by the Technical Section of the Canadian Pulp and Paper Association and TAPPI. John L. Parsons of the Hollingsworth & Whitney Company was general chairman and assisted by G. F. Witty of the Canada Paper Company, and R. M. Drummond of the International Paper Company. At this meeting the status of all phases of groundwood manufacture was reviewed.

The TAPPI Testing Division sponsored an important conference at the Mellon Institute, Pittsburgh, Pennsylvania, on October 11-14, during which the current problems relating to the TAPPI Standards were considered. James d'A. Clark was general chairman.

On October 25-28 the Third Engineering Conference of the Pulp and Paper Industry was held at Buffalo, New York. J. W. Hemphill of the Johns-Manville Company was general chairman. Plant visits were made to the

Westinghouse, Lockport Felt Company, and Upson Company plants.

The last fall meeting was sponsored by the Fibrous Agricultural Residues Committee and was held at the Northern Regional Research Laboratory in Peoria, November 15-16.

Publications

Although the publication practice of the Association followed the pattern of recent years, definite plans were made to change some of these, beginning in 1949.

Technical Association Papers—Series 31 of Technical Association Papers will be the last volume to be printed. It is superseded in 1949 by a monthly technical magazine. Since 1921, the meeting papers of the Association were published in the *Paper Trade Journal*. At the end of each year these papers were collated and printed, together with considerable additional material in a cloth-bound volume called *Technical Association Papers*. Series 31 will contain 820 pages.

Tappi—The establishment of this new magazine to be called *Tappi* and the discontinuation of the use of space in the *Paper Trade Journal* was decided upon after discussions of the subject over several years. The former arrangement was mutually advantageous but there was a growing feeling that the Association could serve its members and the pulp, paper, and paperboard industries better by issuing its own magazine. Publication of the TAPPI Bulletin is now discontinued.

Continuing his fine work as chairman of the TAPPI Bibliography Committee, C. J. West of the Institute of Paper Chemistry prepared a *Bibliography of Papermaking* and *List of U. S. Patents* covering 1947. These bibliographies published by the Association cover the technical literature of the industry since 1900.

TAPPI Standards—Twenty-one standard testing methods were issued in loose-leaf form during 1948. Others prepared in 1948 will be issued early in 1949. It is unlikely that these standards will continue to be issued at the same rate as in preceding years. The methods that are now under consideration demand much more effort in their preparation than those that were issued earlier.

TAPPI Data Sheets—No data sheets were issued in 1948 although several were prepared. These will be issued early in 1949. The early success of the C.P.P.A. Technical Section in preparing engineering data sheets led to the establishment of a similar service by the Technical Association.

Monographs—Two monographs were issued in 1948. Monograph No. 6, "Nature of the Chemical Components of Wood" was sponsored by the TAPPI Fundamental Research Committee and consists of the presentations made at the Appleton Conference in 1947.

Wilbur F. Gillespie, retiring TAPPI president

Monograph No. 7, "Pigments for Paper Coating," was prepared by the Subcommittee on Pigments, of which William R. Willets of the Titanium Pigment Company is chairman. This is one in a series of monographs being prepared by the TAPPI Coating Committee, Werner Kaufmann, Kupfer Bros. Company, chairman.

Local Sections

No new local sections were established during 1948 although the Empire State Section established a branch in June known as the Metropolitan Group which meets monthly in New York City at the famous Fraunces Tavern. The Pacific Section again sponsored an outstanding seminar on fundamental wood chemistry, during which Dr. and Mrs. Holger Erdtman of Stockholm, Sweden, lectured.

Chairmen of local sections elected during 1948 were as follows: *Pacific*—Harold C. Wall, Longview Fibre Company, Longview, Washington; *Lake States*—A. M. Heald, Marathon Corporation, Menasha, Wisconsin; *Delaware Valley*—John P. Weidner, Container Corporation of America, Manayunk, Pennsylvania; *Kalamazoo Valley*—P. W. Bartholomew, Hawthorne Paper Company, Kalamazoo, Michigan; *New England*—C. H. Child, Merimac Paper Company, Lawrence, Massachusetts; *Ohio*—P. S. Cade, Harding-Jones Paper Company, Excello, Ohio; *Empire State*—James E. Foote, B-F-D Div., Diamond Match Company, Plattsburg, New York; *Maine-New Hampshire*—John L. Parsons, Hollingsworth & Whitney Company, Waterville, Maine; and *Chicago*—Warren Price, Applied Research Services, Chicago, Illinois. The *Papermakers and Associates of Southern California* (Unaffiliated) elected Bruce F. Brown, Jr., Fibreboard Products, Inc., Los Angeles, California.

President's Address

In his first remarks, President Gillespie announced that he did not feel that he should deal with the Association's specific accomplishments — rather did he prefer to give a review of the basic factors that had brought progress to TAPPI during the past year. He did not feel there had been any single major accomplishment that had not been made in other years. He did say that the progress in building the TAPPI structure is not characterized by sudden flashes of accomplishment, but rather by a planned steady growth from year to year.

Speaking of the foundation on which the TAPPI structure is built, the President pointed to four main sources from which the Association derives its benefit: (1) Meetings; (2) Publications; (3) Services; and (4) Investigations.

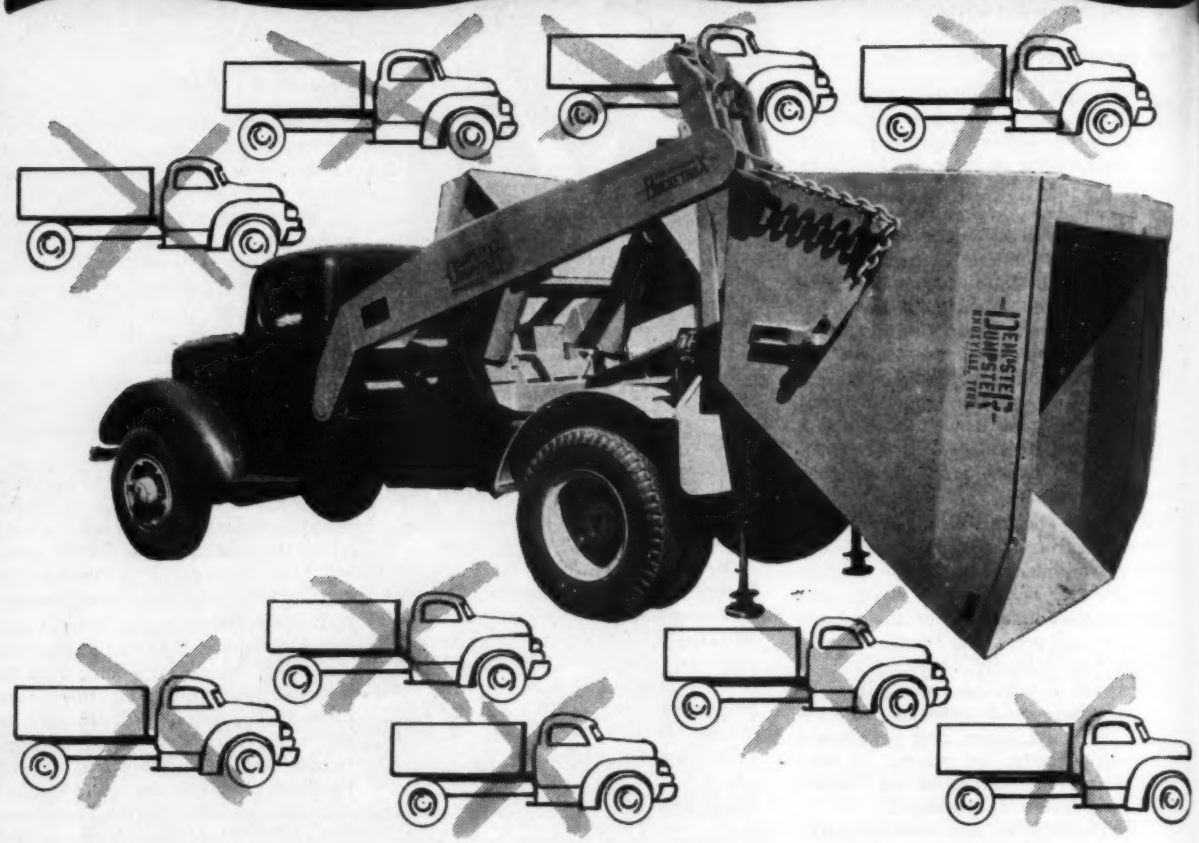
The six fall meetings held during the past year were pointed to by President Gillespie. At the same time he personally complimented those who planned the meetings and provided the excellent programs presented. He mentioned the fall meeting this year in Portland, Oregon (Sept. 11-15), which is being sponsored by the Pacific Section of TAPPI. Much preparatory work already has been done to make this meeting an outstanding one. He urged as many to attend as could find it possible to make the trip.

Speaking of the publication, the president referred to the Association's new magazine, *Tappi*, and reminded the members that the *Technical Association Papers*, formerly available in bound volumes had been discontinued, as previously published. Bound volumes of the technical section of the new magazine *Tappi* will be sold to those who desire them. Referring to TAPPI Monographs, President Gillespie stated these now number seven; he stated that seven more are in various stages of preparation. Two should be ready this year by the Coating Committee.

Of the services rendered by the Association, TAPPI Standards drew special mention. It was stated that some groups consider this service as adequate justification for existence. TAPPI's contribution in this respect has been an outstanding one. Almost 200 standard methods have been contributed, covering a wide range of subjects.

Other services referred to were spe-

One Dempster-Dumpster with 99



Being a large operation, this copper smelter required ten trucks and their crews, a series of push cars, a train car system and loading crews to handle over twenty different kinds of materials on relatively short hauls between plant buildings and outside of the grounds. The materials handled included, scrap of all descriptions, trash, rubbish, new and used brick, excavation spoil, waste oils, filter cake, dust, sand, gravel, cement, fire clay and many others.

A large majority of the handling, re-handling, storage, truck and car equipment and crews standing idle, was eliminated by the Dempster-Dumpster System. Simply stated, this system provides quick pick-up of pre-loaded containers for hauling, dumping or moving material to another location. The three pictures below show how it operates. The left illustration shows the Dempster-Dumpster truck hoisting unit approaching a loaded container. Two chains are attached and the driver returns to controls in the cab. In the center photo, loaded container is hydraulically raised into carrying position. Controls in the cab permit dumping as illustrated at right. You too, may be able to adapt the Dempster-Dumpster System of Materials Handling to your business at tremendous savings. Let one of our engineers discuss this possibility with you.

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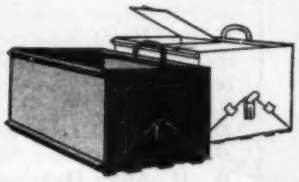
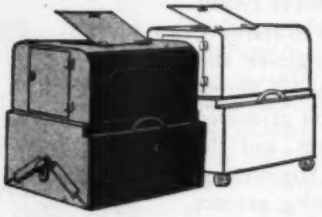
Here, in plain language, is what happened to Materials Handling costs after the Dempster-Dumpster System of Materials Handling was installed in a large Western copper smelting plant. A comprehensive Dempster-Dumpster survey had previously revealed costly delays, unnecessary handling and rehandling of materials, and much time wasted by loading crews. All have been eliminated to the tune of $50,000 savings annually. Fast pick-up, hauling and dumping of pre-loaded Dempster-Dumpster containers has replaced the old method of plant hauling. As a result, nine of the ten trucks formerly detailed for this work were eliminated or put on other work. Ninety-nine detachable containers, built in over 20 sizes and designs for the specific materials they were to handle, were spotted at material accumulation points throughout the plant. Some containers, provided with roller bearing casters, are rolled to indoor accumulation points. Some are handled by fork trucks, other by overhead cranes within plant buildings. As containers are filled, the Dempster-Dumpster truck hoisting unit and one man, the driver, picks each container up, hauls it to its destination, dumps it and returns the empty container for refilling or, loaded container is lowered at any point and left if desired. When you consider that pick-up and dumping of these detachable containers takes less than 60 seconds, and that the entire operation works to an on-the-run schedule, you will realize how one truck hoisting unit can handle 99 containers and do the work formerly requiring ten conventional trucks.

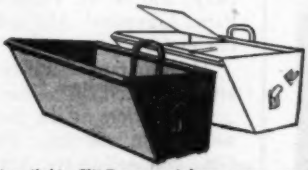
In the panel below are shown the basic types of Dempster-Dumpster Containers used in this installation. The basic containers can be altered with lids, casters, hose and chute connections, etc., to handle accumulations of any type material whether it be liquid, solid, dust, gas, light or heavy materials.



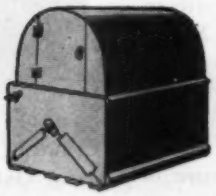
Forty-nine open top, drop-bottom containers in 3, 4, 8 and 10 cu. yd. capacities were spotted at 38 locations throughout the smelter operation. Four of these were 10 cu. yd. containers fitted with two end doors and a circular top opening for chute loading. Three of the 34—4 cu. yd. drop-bottom containers in this group were equipped with self balancing spring lids for special use.



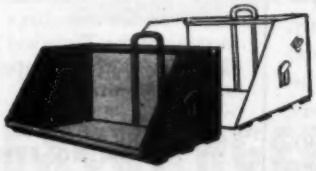
Thirty-three Universal-type containers in 6 and 10 cu. yd. capacities were spotted at 33 locations to receive trash, rubbish and other bulky materials. Two of these were mounted on roller bearing casters for movement to indoor loading locations.



Ten water tight, Tilt-Type containers were required to handle liquids or moist materials. Four of these were open top of 1½, 3 and 4 cu. yd. capacities for four locations. One 4 cu. yd. container with self balancing spring lids was provided at Lab Sample Mill. Three containers, with self balancing lids provided with pipe inlets, were supplied for receiving waste oil at three separate locations. Two 3 cu. yd. containers having three separate compartments with individual lids for each compartment, were required for the zinc electrolytic plant.



Two 10 cu. yd. Apartment-type containers were spotted at the main office and laboratory office to receive large accumulations of waste paper and trash.



Two 4 cu. yd. skip-type, with lip, containers and two 4 cu. yd. skip-type, flat-bottom, containers were spotted at two locations. One 6 cu. yd. flat-bottom, skip-type container was furnished.

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cial reports and the textbooks on papermaking.

The lack of funds to adequately finance investigations that should rightfully be a part of any scientific organization, was deplored by the Association's president. He stated that over a ten-year period, appropriations aggregating less than $16,000,000 have been expended on 15 projects. It was further stated that this was insufficient to handle the work of approximately 70 committees. However, the Association head complimented the work done by a number of the committees, who, as he put it, "have done a magnificent job."

President Gillespie praised the work of the Association's secretary and associates and expressed his appreciation for their assistance during his term of office.

SUPPLY DEALERS DINNER

With nearly 800 on hand, establishing a new high record of attendance, the New York Association of Dealers in Paper Mills' Supplies, Inc., gave its 41st annual dinner and entertainment in the Grand Ballroom of the Waldorf-Astoria, New York, on Tuesday evening, February 22. Among those present at the dinner—always a gala event during Paper Convention Week in New York—were numerous purchasing agents and other officials of paper, board and roofing mills as guests of the supply dealers.

A sumptuous dinner was served, following which an enjoyable stage show lasting fully two hours kept the assemblage in high glee. The several acts were received with vociferous applause. Before and after the dinner many of the supply firms entertained lavishly in private rooms in the hotel.

Walter H. Martens, of George W. Millar & Co., Inc., New York, was chairman of the Banquet Committee, and was assisted by Anthony S. Gaccione, Louis Marcovitz, Miss Shirley Rief, Harris Goldman, John L. Nielson and Arthur Rosenfeld.

An attractive souvenir journal was issued and distributed to commemorate the event. Alfred J. Moran, secretary of the Association, was chairman of the Journal Committee, assisted by Miss Shirley Rief, Alfred Carrano, James Derrico, Anthony S. Gaccione, Joseph P. Gaccione, Nicholas J. Guariglia, David Lipman, Bert Lorenz and Charles Passannante.

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MICHIGAN SUPT. DISCUSS OPERATING AND PERSONNEL PROBLEMS AT FEB. MEETING

A panel discussion of both operating and personnel problems brought out about 80 persons for the February 17, 1949 meeting of the Michigan Division of The American Pulp and Paper Mill Superintendents Association, Inc. Held at Hotel Harris, Kalamazoo, Michigan, the meeting was presided over by Herbert Johnston, Chairman of the Division. Members of the panel were: Ralph Atkins, Lee Paper Company; Henry Nendorf, Rex Paper Company; W. H. Astle, Michigan Paper Company; Arnold Weller, Sutherland Paper Company; L. H. LaLiberte, Kalamazoo Vegetable Parchment Company; Richard Peeters, St. Regis Paper Company; and R. A. Huston, Kalamazoo Paper Company. Mr. Atkins served as moderator.

The program stimulated a very lively and interested discussion period.

In addition to the panel session, a sound film, entitled "Pay Loads Pay Off," released by the Automatic Transportation Company, Chicago, Illinois, was shown. This film, dealing with the subject of materials handling, was well received.

Glen Sutton, fourth vice president of the national organization, also participated in the program. He reported briefly on his attendance at the recent meeting of the Technical Section of the Canadian Pulp and Paper Association, held in Montreal.

▼

COMING EVENTS

Apr. 4-6—National Paper Trade Ass'n, Annual Convention, Waldorf-Astoria, New York City.

Apr. 8—TAPPI (Pacific Section) will meet in Longview, Wash.

Apr. 11-14—National Ass'n of Corrosion Engineers, Fifth Annual Conference and

(Turn to page 1772)

(The program of papers presented before TAPPI, together with abstracts of same, will be found beginning on page 1808 of this issue.)

Hardy S. Ferguson . . . TAPPI Medalist

▶▶▶ THE SEVENTEENTH TAPPI Medal has been awarded to Hardy S. Ferguson, consulting engineer and architect, New York City. Mr. Ferguson was born in 1869 and graduated from Dartmouth College and the Thayer School of Civil Engineering. He has been in engineering practice since 1891, connected with the design and construction of pulp and paper mills, and of water power developments and hydroelectric power plants.

One of his first big jobs was the building of the Great Northern Paper Mill at Millinocket, Maine, completed in 1898. It was here that he developed the first continuous drum barker that was used in the United States. He has been closely connected with the development of the paper machine, particularly in the speed increase from 300 fpm to 1500 fpm. Only once has be ever patented any of his ideas and in this case contributed them to the improvement of the art.

In addition to building the mill of the Great Northern Paper Company he also built mills for the Brown Company, Union Bag & Paper Corporation, Jonquiere Pulp Company, Hollingsworth & Whitney Company, St. Lawrence Pulp & Lumber Company, Penobscot Chemical Fibre Company, Bedford Pulp and Paper Company, St. Maurice Paper Company, Oxford Paper Company, Ha Ha Bay Sulphite Company, Fraser Companies, Riordan Pulp and Paper Company, Gilman Paper Company, Cushnoc Paper Company, Brompton Pulp & Paper Company, Backus-Brooks Company, Bathurst Company, Beaver Wood & Fibre Company, Chicago Mill & Lumber Company, James Maclaren Company, Soundview Pulp Company, Crossett Paper Mills, and others, not including many miscellaneous engineering projects connected with power developments and parts of mills.

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Exhibition, Netherlands Plaza Hotel, Cincinnati, Ohio.

Apr. 13—TAPPI (Empire State Section) Western New York Group will meet at Erie, Pa., sponsored by Hammermill Paper Co.

Apr. 25-28—TAPPI (National) Paper Coating Conference, Pantlind Hotel, Grand Rapids, Mich.

Apr. 28—TAPPI (Delaware Valley Section), Engineer's Club, 1317 Spruce St., Philadelphia, Pa.

May 2-4—Forest Products Research Society, Third Annual National Meeting, Civic Auditorium, Grand Rapids, Mich.

May 10-13—Eighteenth National Packaging Exposition, Public Auditorium, Atlantic City, N.J.

May 26—TAPPI (Delaware Valley Section), Engineer's Club, Philadelphia, Pa.

June 8-9—General Management Conference, American Management Ass'n, New York City.

June 15-17—Annual convention of the Superintendents Association will be held at Chalfonte-Hadden Hall, Atlantic City, New Jersey.

Sept. 11-15—TAPPI (National) General Fall Meeting, Multnomah Hotel, Portland, Ore.

Sept. 16—Conference of Northeastern Wood Utilization Council on Wallboards will be held in Cambridge, Mass., with the cooperation of Harvard University. Attendance limited to 75. Obtain invitations by writing E. L. Heermance, Sec., Northeastern Wood Utilization Council, New Haven 6, Conn.

Oct. 4-7—Society of Industrial Packaging and Materials Handling Engineers, Fourth Annual Exposition, Convention Hall, Detroit, Mich.

Oct. 25-28 — National Safety Council, 1949 National Safety Congress, Chicago.

Nov. 1-5—Pacific Chemical Exposition, California Section, American Chemical Society, Civic Auditorium, San Francisco, California.

Divisional Group Meetings

Writing Paper Manufacturers Association

W. B. Zimmerman, executive vice president of the Howard Paper Mills, Inc., Dayton, Ohio, was elected president of the Writing Paper Manufacturers Association at the 88th annual meeting of that organization at the Waldorf-Astoria Hotel, New York, on Tuesday, February 22. Incidentally, the Writing Paper Manufacturers Association is the oldest trade association in the United States.

Mr. Zimmerman succeeds M. D. Bardeen, of the Lee Paper Company, Vicksburg, Mich., who had served as president for two years. Elected as vice presidents of the Association were A. C. Remley, Neekoosa-Edwards Paper Company, Port Edwards, Wis., and Bruce Crane, Crane & Co., Inc., Dalton, Mass. Morris C. Dobrow was re-elected executive secretary-treasurer. This marks the beginning of Mr. Dobrow's 34th year with the Writing Paper Manufacturers Association. John F. Darrow was re-elected assistant secretary, and Miss Olive F. McGill was re-elected assistant treasurer.

Members elected to the Association's Executive Committee representing the Rag Content Paper Group were Bruce Crane, Crane & Co., Inc., who also was elected chairman of the Rag Content Paper Group; G. H. Gerpheide, Hawthorne Paper Company; A. C. Gilbert, Gilbert Paper Company; Hale Holden, Byron Weston Company; R. S. Madden, Valley Paper Company; D. E. Oberweiser, Fox River Paper Corporation; E. C. Reid, American Writing Paper Corporation; A. J. Schierl, Whiting-Plover Paper Company, and G. E. Williamson, Strathmore Paper Company.

Members elected to the Executive Committee representing the Sulphite Bond Group were A. C. Remley, Nekoosa-Edwards Paper Company, who also was elected chairman of the group; J. G. Conley, Fraser Paper, Ltd.; W. J. Garrity, Munising Paper Company; H. H. Hanson, W. C. Hamilton & Sons; W. L. Jennings, West Virginia Pulp and Paper Company; C. B. Morgan, Eastern Corporation; F. H. Savage, International Paper Company; H. W. Suter, Jr., Champion Paper and Fibre Company, and John D. Zink, Hammermill Paper Company.

In addition, the following were elected to the Executive Committee: R. M. Swaney, Franklin Paper Company, representing the Bristol Board Group; D. T. Quirk, Peninsular Paper Company, representing the Cover and Text Paper Group, and W. F. Tatum, Smith Paper, Inc., representing the Thin Paper Group. H. H. Hanson was re-elected as the Association's representative on the American Paper and Pulp Association's Board of Governors, with H. V. Burgee elected as alternate.

Speakers at the meeting included Raymond Moley, contributing editor of the magazine "Newsweek"; M. D. Bardeen, retiring president of the Association; E. G. Amos, secretary of the American Paper and Pulp Association's Committee on Industrial Relations; W. W. Corlett, counsel, and M. C. Dobrow, executive secretary of the Association.

Harrison R. Baldwin, who retired on January 1, 1949, as vice president of the Hammermill Paper Company, was elected an honorary member of the Association in recognition of his outstanding service on behalf of the industry. Mr. Baldwin was president of the Writing Paper Manufacturers Association from mid-1932 to 1935, and served on the Executive Committee for 18 years.

The L. L. Brown Paper Company, Adams, Mass., was cited as joining the ranks of the Century Club by virtue of the fact that 1949 marks its 100th year of papermaking. Nine other members already have past their 100-year mark. They are the Beckett Paper Company, Crane & Co., Inc., Curtis Paper Company, C. H. Dexter & Sons, Inc., Hurlbut Paper Company, Knowlton Brothers, Smith Paper, Inc., Southworth Company, and Tileston & Hollingsworth Company.

Bristol Board Group

R. M. Swaney, president of the Franklin Paper Company, Holyoke, Mass., was re-elected chairman of the Bristol Board Group of the Writing Paper Manufacturers Association at the annual meeting of the Group at the Waldorf-Astoria on February 21. Other members of the Executive Committee elected were J. B. Cowie, Hollingsworth & Whitney Company, vice chairman; G. A. Carlton, Standard Paper Manufacturing Company; Norman Harrower, Linton Brothers, Inc., and Kendall Wyman, Champion Paper & Fibre Company.

Charles W. Boyce, consultant for the Bureau of the Census, Washington, discussed the trends in and the outlook for the paper industry, and W. R. Settgas, secretary of the American Paper and Pulp Association's Traffic Committee, spoke on current transportation problems. Morris C. Dobrow, executive secretary of the Association, reviewed business conditions during 1948 and the expectations for 1949. "The paper industry," said Mr. Dobrow, "set an all-time production record in 1948 when it produced 22,049,000 tons. There does not appear to be much likelihood that this will be surpassed in 1949. The general business picture indicates that 1949 will see further corrections and readjustments, with business generally good and at a favorable rate throughout the year."

Sulphite Paper Manufacturers Association

The Sulphite Paper Manufacturers Association held its annual meeting at the Waldorf-Astoria Hotel on Monday, February 21, and elected George Stuhr, of the International Paper Company, general chairman for the ensuing year. Leo S. Croy, Marathon Corporation, was elected vice chairman, Bleached Group; Donald F. McCall, Raquette River Paper Company, vice chairman Unbleached Group; Jack B. Cowie, Hollingsworth & Whitney Company, vice chairman Manila Group; Neil E. Nash, Nekoosa-Edwards Paper Company, vice chairman Machine Glazed Wrapping Group, and Gilford F. Henderson, Brown Company, vice chairman Bleached Converting Group.

The Board of Governors elected consists of Wayne A. Brown, Crown-Zellerbach Corporation; James G. Conley, Fraser Companies; Allan G. Hendry, Consolidated Water Power & Paper Company; A. P. Mitchell, Riegel Corporation, and Alfred Southon, Kalamazoo Vegetable Parchment Paper Company. Thomas J. Burke was re-elected secretary and treasurer.

Highlights of the meeting were a most interesting address by D. Clark Everest, president of the Marathon Corporation and a former president of the American Paper and Pulp Association, who was pleasingly optimistic in his forecast of prospects for the paper industry during 1949; an address by W. W. Corlett, counsel for the Association, and a talk by Warren B. Bullock, secretary of the Import Committee of the Paper Industry.

National Council for Stream Improvement

At the sixth annual meeting of the Board of Governors of the National Council for Stream Improvement held at the Waldorf-Astoria on February 23, George E. Dyke president of the Robert Gair Company, Inc., was re-elected chairman of the board. Other officers elected were J. D. Zellerbach and Clyde B. Morgan, vice chairman; J. D Zink, treasurer, and Russell L. Winget, executive secretary and assistant treasurer.

Mr. Dyke presided at the meeting and stated that membership in the Council which is national in scope currently represented over 85 per cent of the pulp, paper and paperboard production in the United States. He said that he had had an opportunity during the past year to follow closely the many activities of the Council, and that he felt confident that notable progress has been made. Judging from the expressions of opinion he had received from members in various regions of the country, it was his belief that the industry was progressively mindful of the importance of the organization and of its activities.

Association of Pulp Consumers

William Beckett, executive vice president of the Beckett Paper Company, Hamilton O., was elected president of the Association of Pulp Consumers at the annual meeting of that organization at the Waldorf-Astoria on February 23, succeeding Hugo H. Hanson, of W. C. Hamilton & Sons, Inc., Miquon, Pa. Five new directors were elected for terms of three years. Robert H. Evans, secretary of the Riegel Paper Corporation; R. Graham Hagey, director of purchases of the Ohio Boxboard Company; P. Koenig, assistant to the president of the P. H. Glatfelter Company; Dwight L. Stocker, president of the Michigan Paper Company, and George E. Williamson, president of the Strathmore Paper Company.

Principal speaker at the luncheon following the meeting and attended by approximately 200 members and guests was Howard E. Whitaker, chief of the Paper and Pulp Section of the Economic Cooperation Administration and vice president of The Mead Corporation. Other speakers were E. W. Tinker, executive secretary of the APPA; R. M. Fowler, president of the Canadian Pulp and Paper Association; James Ritchie, secretary of the United States Pulp Producers Association; James Donaldson, of the Stora Kopparberg Corporation and president of the Association of American Wood Pulp Importers, and John Westergaard, of Castle & Overton, Inc., New York.

Paper Napkin Association

The Paper Napkin Association held an all-day meeting on February 22 at the Barclay Hotel in New York, elected a new board of directors of eight members, and heard an address by the retiring chairman, A. W. Stompe, of the Marathon Corporation, in which intelligent selling as a forerunner of intelligent buying was stressed. Howard Monk, Rockford, Ill., advertising agency executive, who during the past year has been in charge of a paper napkin promotion campaign, also addressed the meet-

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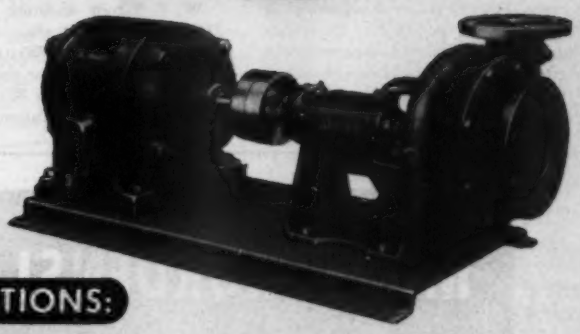

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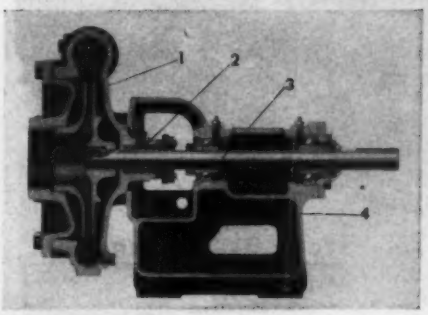

1. **VOLUTE TYPE CASING:** Discharge nozzle swivels to 4 positions. Stud and bolt holes not tapped into liquid passages. Tapped openings for priming, venting, and draining.

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3. **SHAFT:** High strength alloy steel in standard fitted, 18-5 stainless in bronze fitted construction. Has wide spread between bearings to eliminate deflection and vibration.

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ing. The 1949 chairman will be named later. The new board members are W. F. Erisman, E. R. Krueger, J. F. Meyers, R. W. Bertram, M. G. Dokken, Floyd R. Graham, K. C. Hamilton and Norman Eber.

Groundwood Paper Manufacturers Association

At the annual meeting of the Groundwood Paper Manufacturers Association at the Waldorf-Astoria on February 21, James G. Conley, of the Fraser Companies, was elected president, and E. J. Doonan, of the Gould Paper Company, and Lawrence Stedman, of the Kimberly-Clark Corporation, were named vice presidents. These officers together with E. G. Murray, St. Regis Paper Company; R. O. Warner, Minnesota & Ontario Paper Company, and Paul A. Mahoney, International Paper Company, will comprise the Association's Board of Governors for the coming year. R. E. Canfield was re-elected secretary-treasurer.

Thin Paper Group

W. F. Tatum, of Smith Paper, Inc., Lee, Mass., was elected chairman of the Thin Paper Group of the Writing Paper Manufacturers Association at the annual meeting of the Group at the Waldorf-Astoria on February 24. Mr. Tatum succeeds Bruce Crane, of Crane & Co., Inc., Dalton, Mass., who served as chairman for three years. The Thin Paper Group is composed of paper manufacturers who make carbonizing and condenser tissue, cigarette paper and other high grade thin papers.

Speakers at the meeting were J. B. MacAfee, secretary of the Forest Industries Information Committee, and Warren B. Bullock, manager of the Import Committee of the American Paper Industry. Mr. MacAfee discussed public relations activities in the paper industry. Mr. Bullock spoke on U. S. tariff matters, with particular reference to thin papers.

Cover and Text Paper Group

The Cover and Text Paper Group of the Writing Paper Manufacturers Association held its annual meeting at the Waldorf-Astoria on February 23 and re-elected D. T. Quirk, vice president of the Peninsular Paper Company, Ypsilanti, Mich., chairman for the ensuing year. F. A. Barr, of the Holyoke Card & Paper Company, was elected vice chairman, and other members of the Group Executive Committee elected were R. F. Arnold, Strathmore Paper Company; J. H. Dunton, W. C. Hamilton & Sons, and H. T. Johnson, Mohawk Paper Mills, Inc.

James L. Ritchie, secretary of the United States Pulp Producers Association, discussed various aspects of the current wood pulp situation. Morris C. Dobrow, executive secretary of the Writing Paper Manufacturers Association, presented his annual report. "Increased advertising and promotional effort on the part of consumers' goods industries," said Mr. Dobrow, "should afford wider market possibilities for cover and text papers."

Newsprint Service Bureau

John L. Hobson, of the St. Croix Paper Company, Woodland, Me., was re-elected president of the Newsprint Service Bureau at the annual meeting at the Waldorf-Astoria on February 22. Other officers elected for the coming year were Robert O. Sternberger, Pejepscot Paper Company, vice president, and Royal S. Kellogg, of New York City, secretary and treasurer.

Kraft Paper Association

Gilford F. Henderson, of the Brown Company, was re-elected president of the Kraft Paper Association, Inc., at its annual meeting held on February 23 at the Waldorf-Astoria. Wayne A. Brown, of the Crown Zellerbach Corporation, was elected vice president to succeed J. B. Cowie, of the Hollingsworth & Whitney Company, who now has transferred his office to Boston, Mass.

The following also were named to the Executive Committee for 1949-1950: W. M. Allin, Southern Advance Bag and Paper Company; J. B. Cowie, Hollingsworth & Whitney Company; H. S. Daniels, Union Bag & Paper Corporation; J. R. Diggs, Mosinee Paper Mills Company; W. J. Dixon, St. Regis Paper Company; D. G. Driscoll, Sorg Paper Company; K. O. Elderkin, Crossett Paper Mills; L. W. Gould, Gaylord Container Corporation; T. V. Hefferman, Gilman Paper Company; William Mazer, Hudson Pulp and Paper Company;

Ten "Stock-Makers" ready for delivery. Five on repeat orders, five for new customers.

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S. M. Phelan, Jr., West Virginia Pulp and Paper Company; W. C. Shorter, Camp Manufacturing Company, and George Stuhr, Southern Kraft Division of the International Paper Company.

Tissue Association

The Tissue Association, Inc., held meetings at the Waldorf-Astoria on February 22 and 23, and elected H. G. Wintgens, of the Hoberg Paper Mills, Inc., Green Bay, Wis., president for the coming year; C. E. O'Connor, Jr., of the B.F.D. Division of the Diamond Match Company, New York City, vice president, and R. W. Sweet, of the Sweet Bros. Paper Mfg. Company, Phoenix, N.Y., treasurer. Ross A. Fife, of New York City, was renamed executive secretary. The following were elected members at large to the Board of Directors: John J. Cahill, Ben Mont Papers, Inc.; W. F. Erisman, Erving Paper Mills; Samuel Lopin, Hudson Pulp & Paper Company; John McKirdy, Jr., Scott Paper Company; H. L. Nichols, Northern Paper Mills; C. E. O'Connor, Jr., B.F.D. Division Diamond Match Company; B. I. Reider, Victoria Paper Mills Company; W. J. Servotte, Bay West Paper Company; R. B. Stevens, Stevens & Thompson Paper Company; R. W. Sweet, Sweet Bros. Paper Mfg. Company; W. C. White, Jr., Pequannock Valley Paper Mills, and H. G. Wintgens, Hoberg Paper Mills, Inc.

Divisional officers elected were: Toilet tissue—Wayne A. Brown, National Paper Products Company, chairman, and Gordon Ware, Straubel Paper Company, vice chairman. Paper towel—W. J. Servotte, Bay West Paper Company, chairman, and R. T. Cone, Reed Tissues Corporation, vice chairman. Facial—R. M. Young, Pond's Extract Company, chairman, and William Medoff, Sitroux, Inc., vice chairman. Jumbo roll—George Dunn, Dunn Paper Company, chairman, and Ralph Burrows, Burrows Paper Corporation, vice chairman. Wrapping—William Shafer, Flower City Tissue Mills, chairman, and Stanley Reed, Crystal Tissue Company, vice chairman. Gift wrap—Philip C. Toye, American Tissue Mills, chairman, and J. T. Jaret, Ben Mont Papers, Inc., vice chairman. No. 2 wrapping—James F. Suter, Rondout Paper Mills, chairman, and J. L. Sullivan, North End Paper Company, vice chairman. The chairmen of the respective product groups complete the Board of Directors of the Association.

Glassine and Greaseproof Manufacturers

Members of the Glassine and Greaseproof Manufacturers Association held their annual meeting on February 23 at the Waldorf-Astoria, and elected the following Executive Committee for the coming year: Paul E. Hodgdon, Deerfield Glassine Company, Monroe Bridge, Mass., chairman; Folke Becker, Rhinelander Paper Company, Rhinelander, Wis.; Elmer H. Jennings, Thilmany Pulp and Paper Company, Kaukauna, Wis.; Paul F. Moore, Westfield River Paper Company, Russell, Mass.; John L. Riegel, Riegel Paper Corporation, New York City, and Arthur Schwab, Hamersley Manufacturing Company, Garfield, N.J.

The Association voted funds for a 40-

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foot exhibit at the 1949 Packaging Exposition which will be held in Atlantic City, N.J., May 10-13. The exhibit will depict the story of glassine and greaseproof paper as a protective, versatile and economical packaging medium.

Export Committee

Government and industry speakers addressed mill representatives and members of the Export Committee of the American Paper and Pulp Association on present problems in world trade and future prospects on United States exports of paper at the meeting of the Committee at the Waldorf-Astoria on February 21.

Howard Whitaker, of the Pulp and Paper Branch of the ECA, addressed the group on pulp and paper shipments under the ECA program. Harry G. Bengtsson, president of the United States Paper Exporters Council, Inc., and president of the Benex Corporation, reviewed the export merchant's problems in world trade. Joseph Muller, chief of the Forest Products Branch, Office of International Trade, Department of Commerce, addressed the group on "Foreign Trade Opportunities."

Grant Richardson, assistant vice president and manager of sales of the Hammermill Paper Company, and former chairman of the Export Committee of the APPA, spoke on the necessity of industry taking a long-range view on export trade. John Evans, director of the Commodities Division, Office of International Trade, and chairman of the Committee on Reciprocity Information and of the Trade Agreements Committee, reviewed the Havana Charter and the Reciprocal Trade Act and its importance to the domestic industry.

American Pulpwood Association

Frank A. Kelly, of the Northwest Paper Company, was elected president of the American Pulpwood Association at the annual meeting of the Association's Board of Directors at the Waldorf-Astoria on February 23. Other officers elected were M. H. Collett, of the West Virginia Pulp and Paper Company; E. O. Ehrhart, of the Armstrong Forest Company, and R. R. Drummond, of the Oxford Paper Company, vice presidents, and H. E. Brinckerhoff, executive secretary-treasurer.

Waxed Paper Institute

The Waxed Paper Institute, Inc., held its annual meeting at the Waldorf-Astoria on February 23, and re-elected W. P. Patterson, of the Specialty Papers Company, president for the ensuing year. C. C. Sherman, of the H. P. Smith Paper Company, was elected chairman of the board, and the following board members were chosen: P. M. Beach, Riegel Paper Corporation; Ben Lacy, Pollock Paper Corporation; C. F. Christie, Kalamazoo Vegetable Parchment Company; E. L. Berkley, Waxide Paper Company; John Snyder, Marathon Corporation; Louis Kimple, Dixie Wax Paper Company, and G. C. Wieman, Western Waxed Paper Company. A. H. Noelke was named secretary-treasurer, and P. J. Pannier assistant secretary.

Pulp Producers Association

The annual meeting of the United States Pulp Producers Association held at the Waldorf-Astoria Hotel on February 21 was well attended. Regional directors elected for 1949-1950 were: New England—Downing P. Brown, Brown Company; Middle Atlantic—Norman W. Wilson, Hammermill Paper Company; South—Alexander Calder, Union Bag & Paper Corporation; Lake States—W. M. Wright, Kimberly-Clark Corporation, and West Coast—L. K. Larson, Weyerhaeuser Timber Company.

Directors at large elected were: R. M. Buckley, Soundview Pulp Company; William J. Dixon, Gaylord Container Corporation; Amor Hollingsworth, Penobscot Chemical Fibre Company; Stuart E. Kay, International Paper Company; W. S. Lucey, Rayonier Incorporated; James L. Madden, Hollingsworth & Whitney Company; Reuben B. Robertson, Jr., Champion Paper & Fibre Company; John Stevens, Jr., Marathon Corporation, and Lawson Turcotte, Puget Sound Pulp & Timber Company.

Oliver M. Porter, of New York City, was again named executive director.

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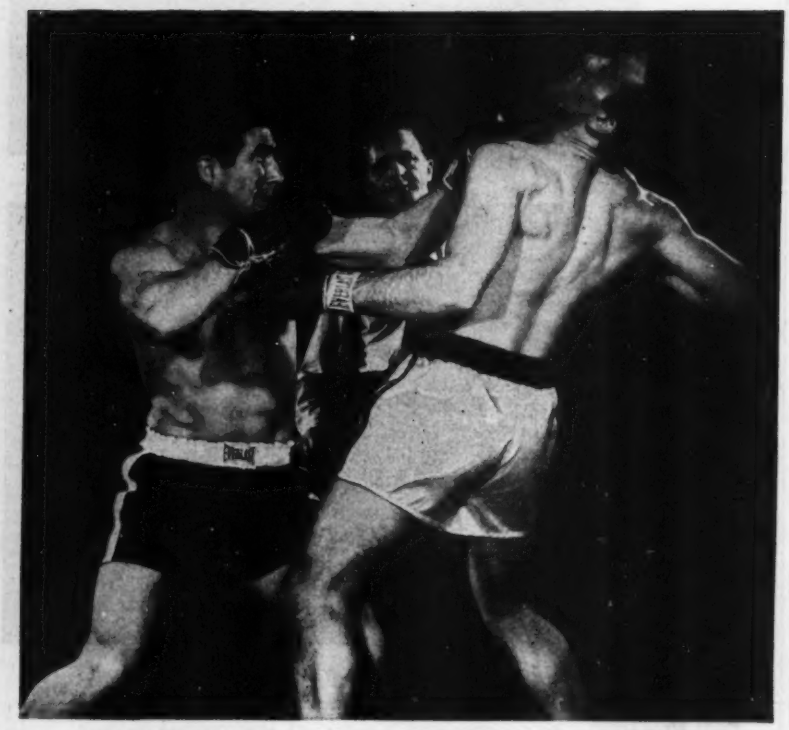
▶▶▶ THE THIRD ANNUAL national meeting of the Forest Products Research Society will be held at the Civic Auditorium in Grand Rapids, Michigan, May 24. Six technical sessions have been scheduled. An exhibit also will be held.



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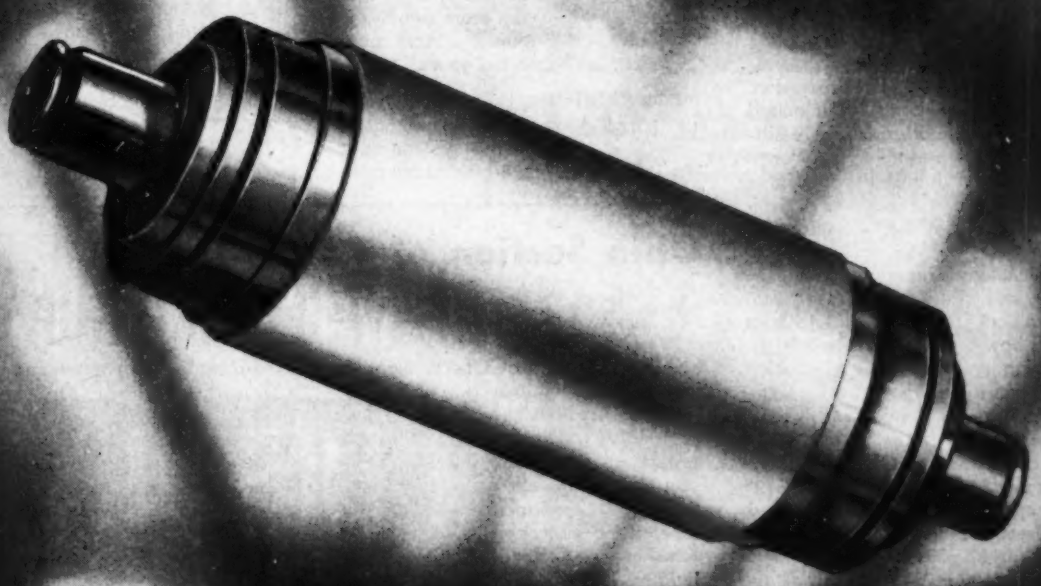

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LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

Thirtieth Anniversary Luncheon of SAPI Is Attended by Notables

▶▶▶ THE ANNUAL MEETING of the Salesmen's Association of the Paper Industry was held on Monday afternoon, February 21, at the Waldorf-Astoria Hotel in New York, with a sizable number of the membership in attendance. Alan B. Helffrich, of the St. Regis Paper Company, New York, was elected president for the ensuing year, succeeding Edward J. Edwards, of the Howard Paper Company. Daniel H. Keck, Kimberly-Clark Corporation, was elected western vice president; George Watson, Mead Corporation, eastern vice president; T. Donnell Evans, W. C. Hamilton & Sons, assistant western vice president; L. Worthington Dodd, Champion Paper & Fibre Company, assistant eastern vice president, and E. G. Amos, secretary and treasurer.

President Edwards presided at the meeting, and in his annual report said that members at all times should keep in mind how best they can benefit the Association and how the Association may benefit them. Both the East and West groups witnessed much activity during the past year, he added.

The membership of the Association numbered 423, as compared with 425 a year ago, Secretary Amos reported. The placement service last year accounted for 17 placements.

The 30th annual luncheon of the Salesmen's Association—always a highlight at the APPA convention in New York—on Wednesday, February 22, was one of the most successful in the long history of the Association. Close to 1,500 crowded the huge Grand Ballroom of the Waldorf-Astoria and enjoyed the interesting program, which, it being Washington's Birthday, was given a patriotic air throughout.

On the dais were many notables in the industry, most of whom were introduced by President Edwards, who acted as toastmaster. James A. Leyden, of the Hampden Glazed Paper and Card Company, and a former president of the Association, led the assemblage in the singing of the national anthem. The President's Annual Award was presented to Ben K. Babbitt, of the Brown Company, Chicago, for his varied activities with the Association's western division during the year. Mr. Babbitt is the first member to win the award for a second time.

Speakers included Earl W. Tinker, executive secretary of the American Paper and Pulp Association, and Dr. William E. Stevenson, president of Oberlin College, Oberlin, O. Dr. Stevenson took as his topic "A Quick Look at the 'Education Industry.'" He praised the paper industry for "continuously raising the standards of responsibility and broadening the ways and means by which it could give assistance and support not only to American business but also to the American people as a whole, whether bankers, lawyers, farmers, craftsmen, white collar workers or just plain citizens. I can think of no industry which has played a more significant part in the development of this great country of ours than has yours."

Education in the United States, like the paper industry, is definitely a "growth industry," Dr. Stevenson said. "In 1870 there were 80,000 students in secondary schools. By 1940 there were 7,000,000. During the same 70 years, the number of college students increased from 60,000 to 1,500,000. In other words, between 1870 and 1940 the number of high school students increased by about 90 times and the number of college students by nearly 30 times, yet during the same period the total population increase was only three times.

"Since 1940 the number of college students has grown to 2,500,000. By 1960, if all the recommendations of President Truman's Commission of Higher Education are carried out, including a program of many scholarships and greatly expanded facilities, college students alone will number more than 4,500,000. The problem is not to find students for the classrooms but rather to find classrooms and teachers for the students."

Ohio Section of TAPPI Hears Address by Dr. D. S. Brown

▶▶▶ AT THE REGULAR monthly meeting of the Ohio Section of TAPPI, held at Hotel Manchester, Middletown, February 15, Dr. Duncan S. Brown, general manager of the Lockland Division of the Gardner-Richardson Company, was the principal speaker. He covered the subject of "Calender Stack Finishes as Applied to Boards and Folding Boxboards." About 104 persons attended the meeting, which was believed to set a record for February meetings of the Section.

Following are some highlights of Dr. Brown's address:

One of the main reasons for using a waterbox on a board calender stack is to obtain a surface property on the board by a more economical method and often times with better results, than by doing it in the beater.

The calendar finishing of board imparts surface smoothness, lays fuzz, gives a shine, makes for a better printing surface and adds color.

Water and starch are the two most common materials used. Most starch solutions are enzyme converted or chlorinated to obtain low viscosities. However, some thick starch solutions are used for making the board somewhat grease resistant, especially if it is to be printed by gloss inks.

When printing board with gloss inks it is desirous to treat the surface of the board to reduce the penetration of the oil vehicle into the board and thus have the ink stay on the surface and dry by oxidation to a glossy shine. Various materials are being used to obtain this condition or property of the board and these include: (1) starch and protein, (2) methylcellulose, (3) kelgin, (4) PLF calender size, and (5) PVA (poly-vinyl alcohol).

Various operating troubles may be encountered with calender sizing, for example: too much foaming, too viscous a solution, sticking and gumming of the calender rolls, and calender wrap due to slime spots and holes in the board.

Another desirous property imparted to surface treated board is that of water resistance. An example of this is sign board on the front of street cars. Wax emulsions have proved very effective in meeting this severe sizing property. However, wax sizes make the board so resistant to water that ordinary glues will not hold, especially in laminating operations. Some of the newer resinous glues are doing a better job, but even these are not perfect.

Grease and oil resistance is still another property that is of value when the board is used to package greasy and oily materials. Silicate is the cheapest material used to obtain grease resistance, but makes an inferior board as compared with glassine or special laminated grades.

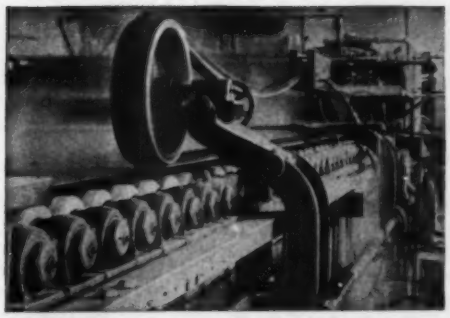
Another purpose of treating board on the calender is that of coloring. This operation is used to obtain a surface appearance by a cheaper method than dyeing in the beater. The depth of color can be varied from a slight tint to a deep brilliant shade. Dyeing the stock somewhat in the beater is used in addition to coloring at the calender, especially when obtaining

On wet, hot or dusty jobs... get better lubrication with

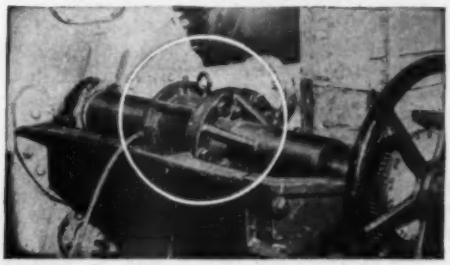
SUPERLA GREASES

Superla Greases are available in two types and a wide range of grades. You will therefore find them the answer to better lubrication of anti-friction bearings under many operating conditions.

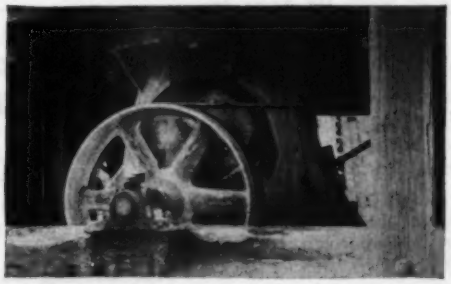
Just a few examples are briefly described here. The booklet gives more details of the properties and qualities of Superla Greases. It may help you save maintenance and money by showing you how to reduce bearing failures. Write Standard Oil Company (Indiana), 910 S. Michigan Avenue, Chicago (80), Illinois, for a free copy of the booklet.



WET Wet-end roll bearings on paper mills are particularly difficult to lubricate because they are subjected to a constant shower of water. They require a high grade moisture-resistant lubricant such as Superla Numbered Greases, which are lubricating many installations of this type.



HOT In Jordan bearings, pressures are high and excessive temperatures frequently occur. The high grade Stern Stafford anti-friction bearings pictured above have been successfully lubricated for a number of years with high temperature Superla X Grease.



DUSTY Because all bearings can't be operated in air-conditioned surroundings, some, like the crusher bearings pictured above, need the all-weather protection of Superla Grease. Before Superla was used, these bearings twice needed replacing because of summer overheating, which allowed the grease to leak out and dust to get in. With Superla Grease, no bearings have failed, summer or winter.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

★ LUBRICATION ENGINEERING

some of the brilliant and deep colors.

Advantages of calender coloring are: (1) economical, (2) brilliant shades, and (3) some of the newer dyestuffs can be used to better advantage. However, there are some disadvantages, and they are listed as follows: (1) reduced light fastness, (2) tendency to bleed more with water (except when alcohol soluble dyes are used), and (3) there may be a difference in dye take up across the deckle of the board, which is usually due to moisture and formation variations.

Some boards are treated with flameproofing reagents to reduce fire hazards. Silicates also make the surface of boards resistant to rub.

Boards are usually sold on a weight basis and quoted according to gauge list finishes. There are four different finishes for any given caliper. These are No. 1, 2, 3, and 4, with No. 1 having the roughest surface and No. 4 the smoothest. Weight variations of no more than 10 per cent are tolerated.

The speaker next discussed some of the mechanical set-ups of calender stack equipment and operation. First would be the equipment needed to prepare the various solutions. Pumps are required to supply the solutions to the calender or in case of gravity feed, to return it to the supply tank. Finally come the water boxes which are usually made of wood or metal, and vary in width from a foot to two inches. The water box acts as a retainer to allow the solution to run onto the roll and up to the mip.

Some of the variables affecting the surface sizing of board for water resistance are: (1) surface of the paper or porosity, (2) use of wetting agents in sizing solutions, (3) condition of calender rolls, (4) weights applied to calender rolls, (5) position of water boxes (top or bottom of stack), and (6) moisture in board.

Moisture can be applied to board by steam sprays or moisture vaporizers. Frequently two regular steam dryers are placed between two calender stacks.

If the board comes too dry from the machine the properties of the board may be destroyed somewhat when you wet it again at the calender.

There are always two water boxes, one to treat the top side and one for the bottom. Otherwise, there would be a severe curl to the treated side. This is just the opposite to paper as it curls away from the wetted side.

Considerable trouble occurs with corrosion and/or pitting of the cast-iron calender rolls. Causes of this are attributed to a build-up of an acid sizing solution due to leaching of alum from the board, and a constant rusting action of the calender roll.

To stop this, the size solutions are buffered with certain salts, and corrosion resistant surfaced rolls have been tried. These seem to last for awhile but then go bad. Alloyed rolls have been tried, but have not proved the entire answer.

At the conclusion of his talk, Dr. Brown generously answered a number of questions. Some of the questions that evoked considerable interest are listed here, together with answers given by Dr. Brown:

Q—When you are coloring at the calender, do you use a slack-sized board?

A—The board is usually sized less than when you size an ordinary writing paper. If the board is too strongly sized, wetting agents are used. A drop of water will spread out instead of soaking into a board that has been treated with a wetting agent.

Q—How does high temperature drying of the board affect its take up of solution?

A—If the board becomes case hardened there will be considerable variation in take up of solution.

Q—How far can you go with temperatures and steam pressures before case hardening occurs?

A—Case hardening is determined by visual inspection of the board. If the board is in contact with 15 to 20 dryers at 240 Fahr., high pressure steam can then be applied without developing case hardening.

Q—If the board is over dried, and then given a heavy water finish, will this hurt the strength of the board and its sizing (or its water resistance)?

A—No.

Q—How can you prevent foaming of the calender sizing solution?

A—Three steps: (1) select materials that don't foam, (2) have a mechanical set-up that doesn't work air into the solution — no high speed pumps, avoid vortex in water box overflow return, and (3) use foam killers. Care should be exercised in using foam killers as they may destroy the property desired in the board or impart odors as does kerosene.

Q—Do you put the water boxes on the first stack, followed by one or two other stacks?

A—That is the usual practice. However, when using "methocel," the application is at the finishing stack as methocel is soluble in cold water and not hot, and it is therefore necessary to cool the board before treating it with this particular solution.

Q—What about slippage in the calender stack?

A—This is a factor to be considered. Soft rolls develop more friction which is helpful in getting a smoother surface.

Q—What is the per cent moisture pick-up when using two water boxes?

A—About 4 per cent when treating a slack sized board and 2-2.5 per cent when treating a moderately size board.

The annual meeting of the Ohio Division of TAPPI with the election of officers has been changed to April 21, Hotel Manchester, Middletown, Ohio. A cocktail party for the members is again sponsored by Shartle Bros. Machine Company.

Dr. Van Horn Speaks on Current Stream Pollution at Kalamazoo Section of TAPPI

▶▶▶ THE SUBJECT OF the regular meeting of the Kalamazoo Section of TAPPI at its regular meeting on February 3 was the current deinking mill waste treatment project now nearing the building stage at the Michigan Paper Company's mill in Plainwell, Michigan.

The main speaker was Dr. Willis M. Van Horn, of The Institute of Paper Chemistry, Appleton, Wisconsin. Prior to Dr. Van Horn's talk, Dr. Stephen Kukolich, of the Lee Paper Company, Vicksburg, Michigan, program chairman, had arranged for a brief panel discussion on the general problem of paper mill stream pollution.

Members of the panel were four men from the Kalamazoo River Improvement Council which has been instrumental in getting preliminary plans prepared for construction of the first commercial-sized water clarification plant in the history of the paper industry. The panel consisted of: Jack Gilman, Allied Paper Mills; James A. Wise, Kalamazoo Paper Company; Dwight Stocker, Michigan Paper Company, and Anthony Palladino, resident engineer in charge of the Plainwell project for the National Council of Stream Improvement and the six-mill Kalamazoo Valley group.

The men on the panel told of the general progress of the project and of the technical details perfected during the study by Phillip Morgan, who was resident engineer prior to Mr. Palladino. It was Morgan's research which lead to discovery of the bacterial method of removing oxygen-depleting substances from the deinking waste before it is discharged into the river.

In his talk before the Association, Dr. Van Horn made the statement that

FIG. 2228 SCREW ENDS

FIG. 2229 FLANGE ENDS

Double disc rising stem.

THE accompanying views in the modern paint manufacturing plant of W. P. Fuller & Co., show the application of hundreds of Fig. 2228 valves on solvent processing operations. LUNKENHEIMER Fig. 2228 carries a pressure rating of 200 lbs. steam (400 lbs. water, oil and gas) making the valve suitable for a wide range of power plant uses as well as industrial services. These valves, selected for plants from coast to coast, embody traditional LUNKENHEIMER quality, assure longer valve service, lower operating costs and greater dependability. The same advantages are available *and* important to you. Write for details today.

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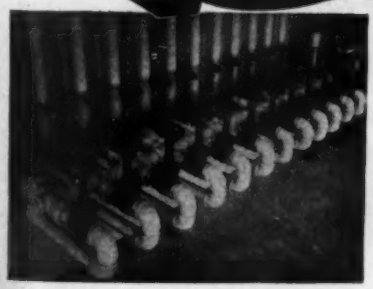
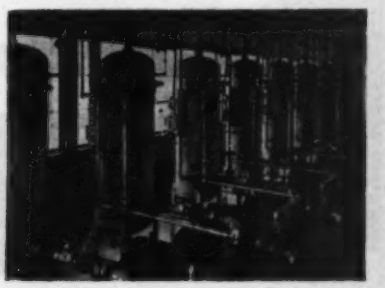
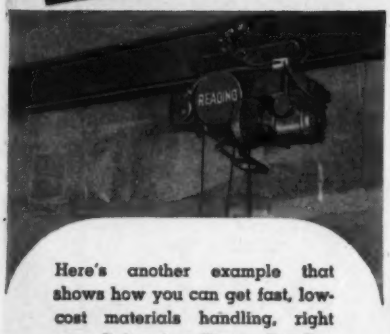
Views in modern plant of W. P. Fuller & Co., pioneer western paint mfrs., San Francisco, Cal. Mech. and elec. engineer: G. M. Simonson. Mech. contr.: Scott Co., San Francisco.

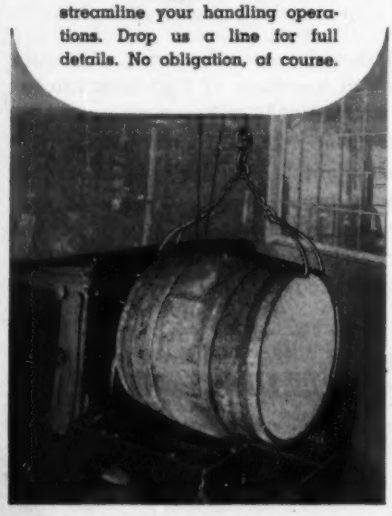




HOW ONE PLANT
Streamlines
MATERIAL HANDLING



Here's another example that shows how you can get fast, low-cost materials handling, right now. Before installing a *Reading* engineered system, this plant had to wheel heavy barrels to the mill via hand trucks. To streamline the operation, *Reading* Engineers were called in. A one-ton Reading Electric Hoist, operating on a built-in parallel trolley, was recommended. Now barrels move faster—less manpower is tied up—and the entire operation costs far less!
Let Reading Engineers give you *practical* suggestions that can streamline your handling operations. Drop us a line for full details. No obligation, of course.



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"Current interest in stream pollution is but one manifestation of the fact that our country is approaching its saturation point from the standpoint of population. . . . Many years ago," he continued, "biologists predicted that the United States would reach its normal maximum population about 1960. The units of any normal population compete with each other for the use of the available natural resources among which are the streams and rivers, and this competition becomes more severe as the population approaches or passes its normal maximum. As the population grows, people become more and more aware of the circumstances of their environment—in the current situation the stream pollution problem."

The speaker reviewed the economic and industrial development of the country and its dependence on the use of streams. He said that the pulp and paper industry must have a large and economic source of water, without which it cannot exist. There is no question that such use of water may depreciate its use for other purposes. The pulp and paper industry has recognized its responsibility in this respect and has made great strides in solving its problem. He said, however, that much remains to be done, and although this task presents many difficulties, the industry confidently expects to place itself in a position where it can use the water without causing grounds for reasonable complaint.

S A F E T Y

SAFETY CONTEST SCORES

▶▶▶ THE INJURY frequency rate continued to decline in January when the rate was reduced to 9.46, the lowest rate recorded in any month thus far during the present contest. The lower monthly rate reduced the cumulative rate to 11.75 from 12.01 at the end of December. The cumulative rate, too, was the lowest recorded in the present contest, and 1.5 per cent below the previous best monthly rate of 11.91 recorded in November.

As the contest entered the last half of the year, the number of contestants totaled 328—the Paper Mill Division has 237, the Remanufacturing Division, 91. At the close of January, 39 of these mills show a record of no reportable injuries:

Division I—Paper and Pulp Mills

Group A (None)

Group B

West Virginia Pulp & Paper Co., Tyrone, Pa.

Howard Smith Paper Mills, Ltd., Beauharnois, Que., Canada.

Group C

Price Bros. & Co., Ltd., Jonquiere, Que., Canada.

Spaulding Fibre Co., Inc., North Rochester, N.H.

Certain-teed Products Corp., York, Pa.

Group D

Hollingsworth & Whitney Co., Waterville, Me.

Manistique Pulp & Paper Co., Manistique, Mich.

Container Corp of America, Carthage, Ind.

Armstrong Cork Co., Pensacola, Fla.

Certain-teed Products, Richmond, Calif.

Mead Corp., (Wheelwright Div.), North Leominster, Mass.

Marathon Corp., Ashland, Wis.

National Gypsum Co., Kalamazoo, Mich.

Strathmore Paper Co., (Mill No. 1), Woronoco, Mass.

Container Corp. of America, (Calif. Container Div.), Los Angeles, Calif.

American Writing Paper Corp., (Albion Div.), Holyoke, Mass.

Fort Wayne Corrugated Paper Co., Vincennes, Ind.

International Paper Co., Livermore Falls, Maine.

National Gypsum Co., Newburgh, N.Y.

American Writing Paper Corp., (Mt. Tom Div.), Holyoke, Mass.

Kimberly-Clark Corp. of Canada, Ltd., Kapuskasing, Ont., Canada.

Division II—Paper and Board Remanufacturing

Group A

Flintkote Co., Chicago Heights, Ill.

Group B

Canadian Cellucotton Products Co., Ltd., Niagara Falls, Ont., Canada.

Container Corp. of America, Cleveland, Ohio.

Container Corp. of America, Anderson, Ind.

Group C

Kimberly-Clark Corp., Appleton, Wis.

Gaylord Container Corp., Atlanta, Ga.

Orchard Paper Co., St. Louis, Mo.

Certain-teed Products, Dallas, Tex.

Marinette Paper Co., S. Glens Falls, N.Y.

Gaylord Container Corp., Tampa, Fla.

Pillsbury Mills, Inc., Wellsburg, West Va.

Thilmany Pulp & Paper Co., (Bag Mill), Kaukauna, Wis.

Research Products Corp., Madison, Wis.

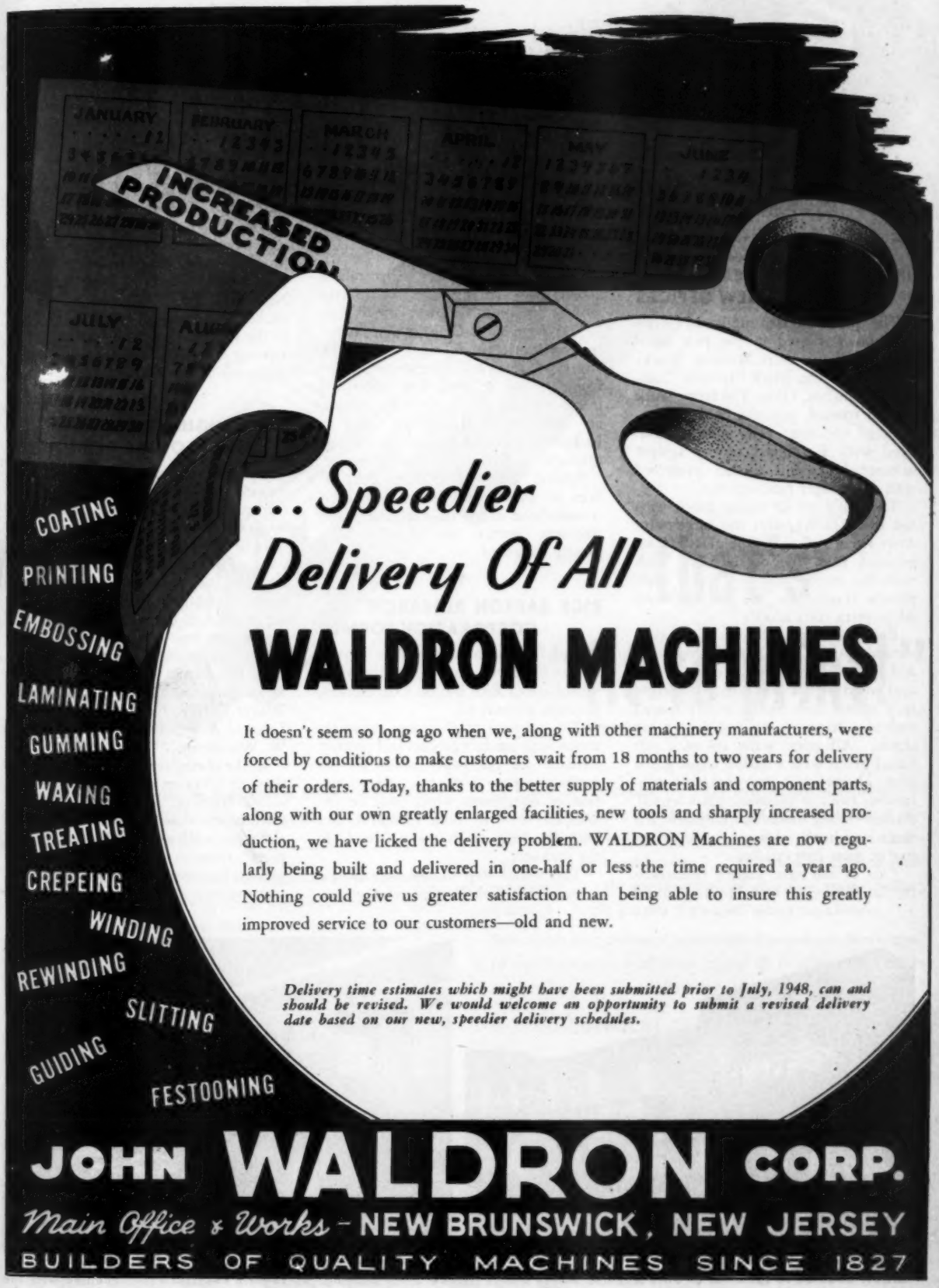
Certain-teed Products, Buffalo, N.Y.

Flintkote Co., Hollywood, Calif.

ABC Corrugated Box Co., Minneapolis, Minn.

Bay West Paper Co., Green Bay, Wis.

Container Corp. of America, Atlanta, Ga.



... Speedier Delivery Of All WALDRON MACHINES

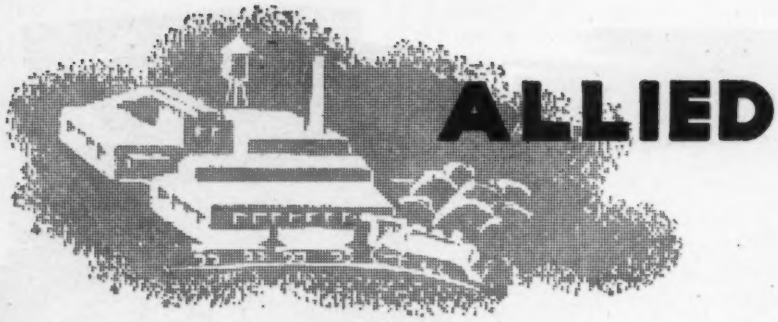
It doesn't seem so long ago when we, along with other machinery manufacturers, were forced by conditions to make customers wait from 18 months to two years for delivery of their orders. Today, thanks to the better supply of materials and component parts, along with our own greatly enlarged facilities, new tools and sharply increased production, we have licked the delivery problem. WALDRON Machines are now regularly being built and delivered in one-half or less the time required a year ago. Nothing could give us greater satisfaction than being able to insure this greatly improved service to our customers—old and new.

Delivery time estimates which might have been submitted prior to July, 1948, can and should be revised. We would welcome an opportunity to submit a revised delivery date based on our new, speedier delivery schedules.

JOHN WALDRON CORP.

Main Office & Works – NEW BRUNSWICK, NEW JERSEY

BUILDERS OF QUALITY MACHINES SINCE 1827



UNIQUE MODERN FEATURES SEEN IN DILTS NEW OFFICES

The most modern up-to-date construction was used in the new office building of the Dilts Machine Works Division of the Black-Clawson Company, Hamilton, Ohio. The frame work is steel trussed, and the floors are reinforced concrete. The roof is insulated with Foamglass blocks against summer heat, and further protected with a five-layer built-up roof.

The walls are of cinder block with red brick facing, and the large windows are of diffusion type glass blocks, recessed from the outside and flush with the inside plastered walls, completely framed on the outside with white terra cotta blocks.

Entrance to the office is plate glass with aluminum and stainless steel trim, and the reception room is done in natural wood with a wall pattern of eight inch square cork blocks evenly spaced and of a harmonizing but deeper tan shade. All other walls are of a soft pastel green with a darker wood green trim. Lighting is provided with continuous rows of prismatic glass lensed, flushed ceiling mounted fluorescent fixtures, and in all reading areas is thirty-five or more foot candles.

One of the most unique features is the latest type of movable flush metal insulated steel partitions, so that offices can be increased or decreased in size with a minimum of effort and repair.

Fire protection facilities are in accord with the most rigid codes, the electric wiring and telephone circuits being carried in fiber duct embedded in the concrete floors. The building is air conditioned throughout, and is heated by warm filtered air introduced through air diffusers in the ceilings.

Several formerly overcrowded offices in separate buildings have been consolidated in the new building, and customer service has thereby been greatly enhanced.

▼

RICE BARTON RESEARCH CORPORATION FORMED

The formation of the Rice Barton Research Corporation, a wholly-owned subsidiary of Rice Barton Corporation, has been announced.

The purpose of this new organization is to conduct process and product research for the paper industry. Its further purpose is the sale and promotion of equipment which will be developed with its own resources and with the help of its many friends in the industry.

The initial step in this direction is a connection with Kurt Wandel, whereby the Rice Barton Research Corporation will further develop and sell machines basically designed by Mr. Wandel and known to the industry as "DynoMachines." Rice Barton Research Corporation has the exclusive sale and further development of this line of equipment—DynoPulpers, DynoFiners and DynoChests.

▼

▶▶▶ TWO TECHNICAL engineers for Evans' Rotabelt Suction Unit, Messrs. W. L. Speir and Austin Barrett, have arrived in the United States to collaborate with engineers of the Paper and Industrial Appliances in New York City. This company is the exclusive licensee for the Rotabelt Unit in the United States and Canada. The visiting engineers will assist in the installation of the Rotabelt Units.

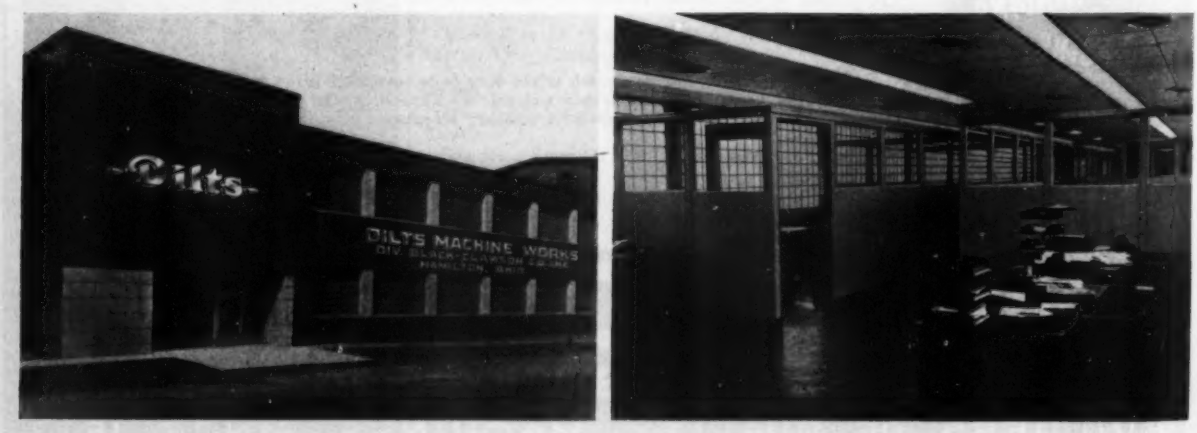
▼

RUST ENGINEERING FORMS NEW PROCESS DESIGN CO.

A new company, called the Rust Process Design Company, has been formed to take over the expanding activities of the Process Engineering Division of The Rust Engineering Company, Pittsburgh, Pennsylvania. The handling of over-all contracts in the fields of chemical processing and refining work will be facilitated by formation of the new company.

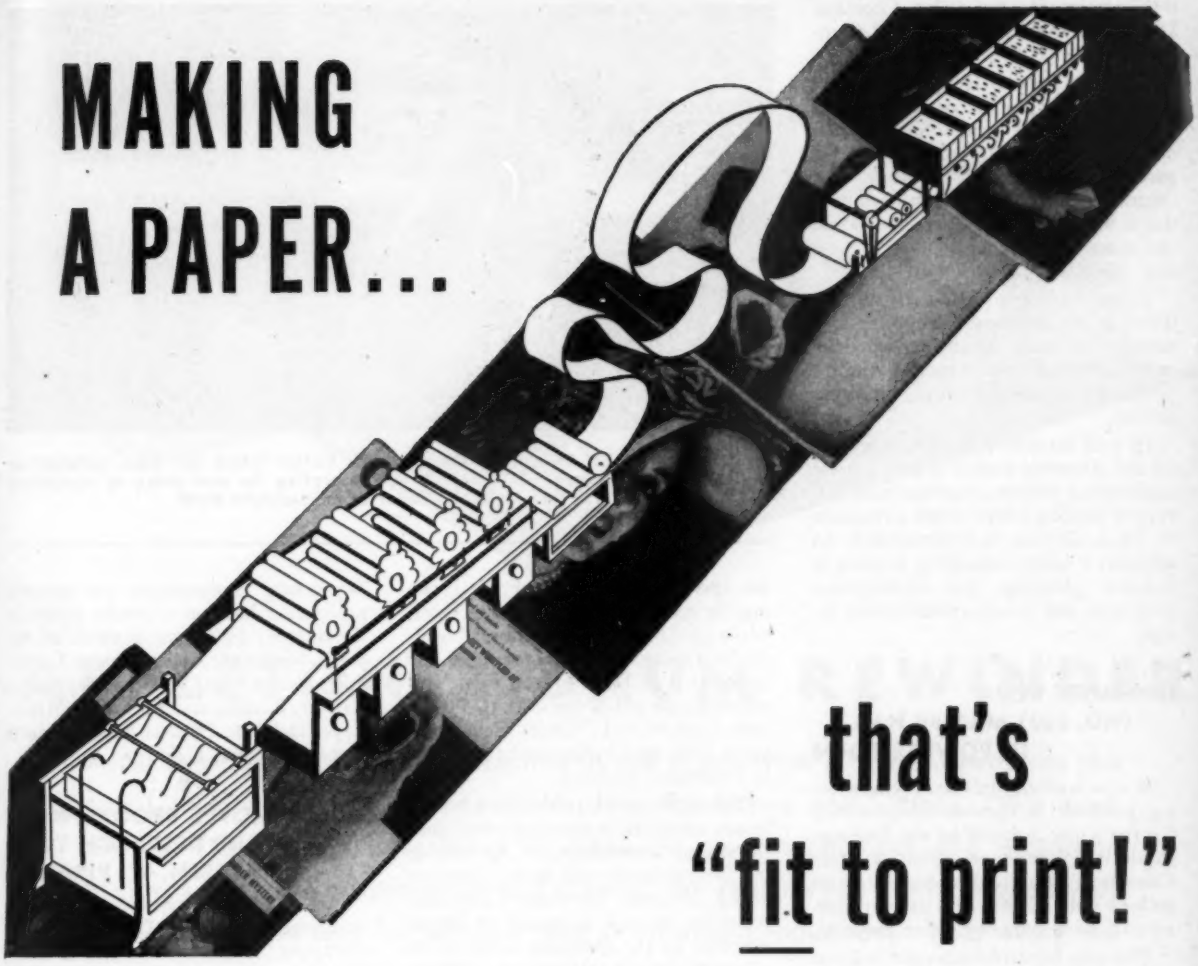
Four experienced process engineers from the former division were named as an executive committee. They are: Walter L. Bass, Dr. John A. Patterson, Leonard A. Wasselle, and Dr. Wendell W. Waterman.

In the chemical field, Rust completed work in 1948 on cellulose acetate, cellulose treating, and acetone recovery facilities for American Viscose Corporation, as well as installation of complete chemical plant equipment and service facilities for the production of pharmaceuticals, pigments, and syn-



Newest addition to facilities of Dilts Machine Works Div. is its new office building. Up-to-date construction is coupled with the latest modern features in finishing and decoration

MAKING A PAPER...



that's "fit to print!"

Like the star editor in the publication office, NOPCO KF* —*star "bubble-buster"*—helps the paper manufacturer to make a paper that's fit to print.

NOPCO KF improves sheet formation even at increased machine speeds by eliminating the twin foes of good paper production—excess foam and faulty fiber dispersion. Entrained air — common cause of thin spots — is dissipated as if stock were being handled at slow speeds —because NOPCO KF keeps working on the wire.

***NOPCO KF** provides these 9 advantages.* (1) *one-minute* preparation of KF emulsion . . . (2) *two-minute* dispersion of foam at head-box . . . (3) *five-minute* elimination of bubbles from wire . . . (4) at least 75% reduction of thin spots . . . (5) production of more paper with fewer clean-ups . . . (6) reduced breaks . . . (7) improved surface characteristics . . . (8) conservation of valuable paper making material . . . (9) greatly increased water repellency.

See what this chemical substance—expressly formulated to aid formation and make paper fit to print—can do in your mill. Order enough for a trial run now.

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SUPER "BUBBLE-BUSTER"

An affiliate of the American Pulp and Paper Mill Superintendents Association

*Reg. U. S. Pat. Off.

thetic resins for the Calco Chemical Division of American Cyanamid Company.

The Rust Process Design Company, under the new plan of organization, is set up to handle prime contracts for design, engineering and construction particularly in the petro-chemical and organic chemical fields, with personnel that is also experienced in conventional and specialized refinery operations and fine chemical processes.

The new company also plans to continue as an authorized engineer-constructor for units producing ethylene and aromatics by Socony-Vacuum's patented Thermofor Pyrolytic Cracking process.

Its staff services will include technical and economic studies of new process engineering projects, together with surveys of existing plants where expansion or modernization is contemplated. In addition it offers consulting services in research planning and development programs, and in experimental unit design.

▼

UFORMITE RESIN (NO. 520) MAY BE HAD IN POWDER FORM

A new wet strength resin is now being produced in commercial quantities for the paper industry by the Resinous Products Division of Rohm & Haas Company. It is said to be unique in its long-term stability and its adaptability to a wide range of paper products.

The urea-formaldehyde resin is Uformite 520 and is identical with the liquid Uformite 467, except that it is supplied in powder form. Its useful life (a year or longer) becomes important in mills where runs of wet strength paper are sporadic or where storage and handling of liquid resins in the plant may be impractical. It is designed to improve the retention of rosin size and other beater additives, like its liquid counterpart, and to impart better fold as well as increased pick-resistance to printing papers, as well as to increase economically the wet-rub resistance of starch-clay coatings.

Uformite 520 (which is completely soluble in water and gives solutions water-clear in appearance) may be added directly to the beater, fan pump, stuff chest, head box, or at other points on the wet end of the paper machine where adequate agitation insures dispersion of the resin in the stock.

Like 467, Uformite 520 does not develop its full wet strength immediately off the machine; a natural aging period of from one to two weeks at 75 Fahr. is required. As a consequence, broke recovery is accomplished readily without special precautions. Fresh broke may be returned directly to the beater, while aged broke can be defibered readily by raising the temperature in the beater to 140 Fahr. to 160 Fahr. and adjusting the pH of the stock to 4.0-4.9 with alum or acid. Under such conditions, fully aged broke can be repulped in a matter of minutes.

The retention of rosin size and other beater additives is also improved with the use of Uformite 520. As little as 0.5 per cent resin will greatly improve sizing efficiency of rosin. Improvements in the pick resistance of several numbers on the Dennison scale can be obtained in printing papers. When used to improve the wet rub of starch-clay coatings, from 10 to 20 per cent resin solids based on starch solids will provide wet-rub resistance equal to that obtained with casein formulations.

New Seybold Model 36-in. Auto-Clamp Paper Cutter which has been installed at the Chicago Lithographic Institute. Shown operating the new piece of equipment is Frank Oehme, member of the Institute Staff

▼

WYANDOTTE CHEM. CORP. ACQUIRES SITE IN OHIO VALLEY FOR EXPANSION

Approximately 200 acres of land at Dilles Bottom, Ohio, ten miles south of Wheeling, West Virginia, was recently acquired by the Wyandotte Chemicals Corporation, of Wyandotte, Michigan. A 2300 ft. frontage on the Ohio River is included in the property. The new site was acquired for future additions to the corporation's organic chemical facilities, and for expansion of their electrolytic chlorine and caustic soda plants, although no immediate construction is contemplated.

Natural resources of salt, coal, oil, gas and water are either on or adjacent to the property. Rail, highway, and barge transportation as well as electric power are available.

Acquisition of this property gives the Wyandotte organization its seventh production location:—parent plants at Wyandotte; limestone quarries at Alpena, Michigan; coal mines at Curtisville, Pennsylvania; geologic deposits at Calvert, Kansas, and Buckman, Mississippi, and The Natural Soda Products plant at Keeler, California.

▼

GLYCO MOVES BROOKLYN MFG. AND RESEARCH TO NATRIUM, W. VIRGINIA

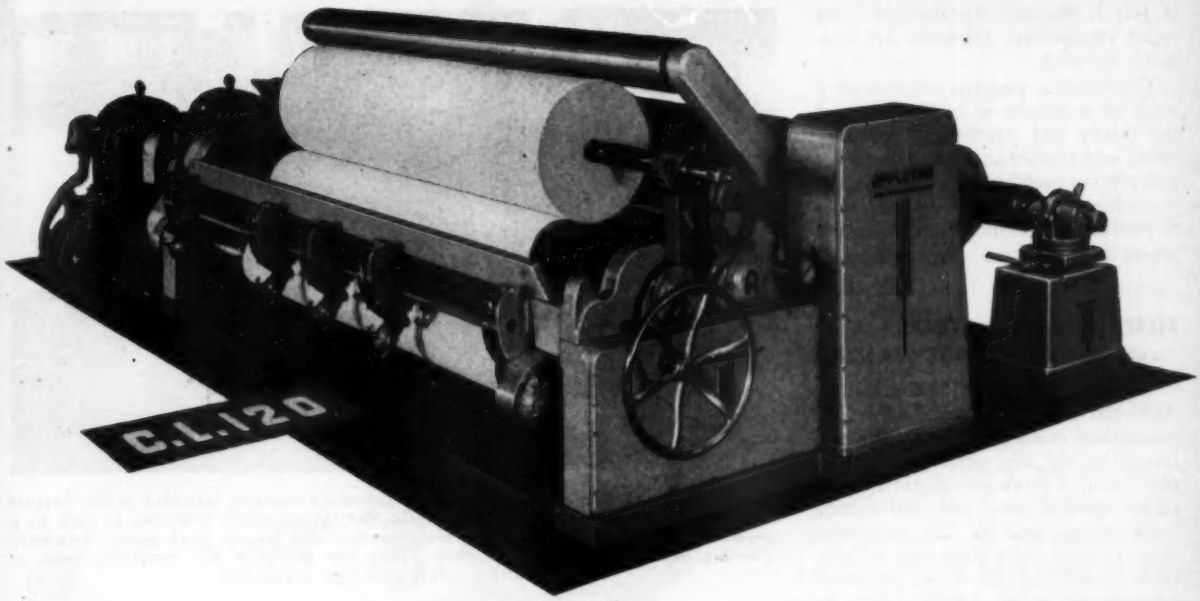
All of the Brooklyn manufacturing and research facilities of Glyco Products Company, Inc., have finally been transferred to the main plant at Natrium, West Virginia, which is about 85 miles south of Pittsburgh and 32 miles south of Wheeling. This more central location puts it in an improved position for receiving raw materials and shipping finished products.

New stainless steel and glass-lined equipment installed for the manufacture of polyoxyethylene stearates and glyceryl monostearates is of the most recent design, and sufficiently large to take care of greatly expanded demands. These types of emulsifiers and stabilizers are used in the paper, plastics, textile, rubber, paint, drug, and various other industries.

▼

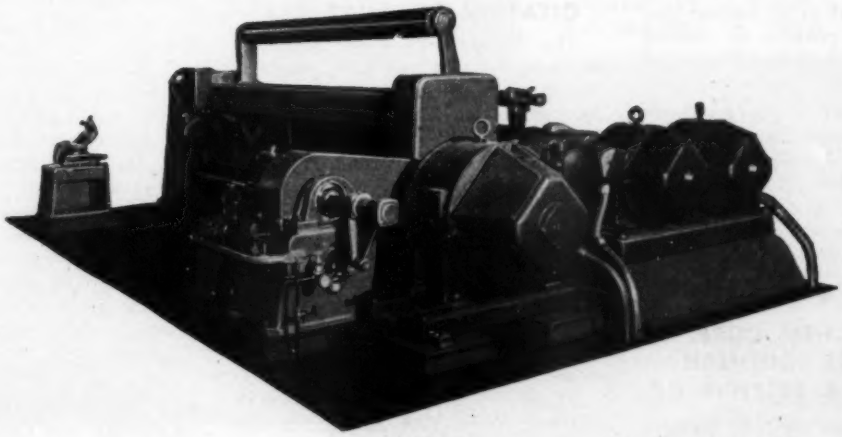
BAILEY METER INCREASES STAFF OF FIELD ENGINEERS

Twenty-seven men have been added to the Bailey Meter Company's staff of field engineers. All engineering graduates of universities or technical schools, they have completed the company's special training program, a requisite for all Bailey Meter engineers. In anticipation of a coming need for even greater expansion of its staff of engineers, another training program to start



APPLETON 2 DRUM REWINDER

After thorough and extensive testing in mill production Appleton presents the new L model mill-type paper roll Winders, Rewinders and Slitters. We have prepared a bulletin describing in detail its new mechanical and electrical features, the ease of operation and control, the reasons for the high quality of the finished rolls and for efficient and profitable production. Your copy will be sent upon request or an Appleton Sales Engineer will call if you desire.



APPLETON WINDERS & REWINDERS

THE APPLETON MACHINE COMPANY • APPLETON • WISCONSIN

Eastern U. S. A. and Foreign Sales • CASTLE & OVERTON, Inc., 630 Fifth Avenue, New York City

in July is planned. Applications from recent engineering graduates are now being accepted.

The training program consists of a study of principles of combustion and the theory and practice of measurements and control as applied to power and process problems. Factory training is combined with lectures by specialists to provide a well integrated course of practical knowledge.

▼

FILMS AND FILM STRIPS ON GRAPHIC ARTS WANTED

The Audio-Visual Aids Committee, American Association of Teachers of Journalism, is searching for motion picture films and film strips on typography, printing processes, engraving processes, photography and the related fields of paper and ink. The committee plans to view these films and evaluate them as teaching aids in an annotated bibliography to be published later in the year.

If you use films of this nature or know of firms producing or handling such films, please get in touch with Carroll Coleman, School of Journalism, University of Iowa, Iowa City, Iowa.

▼

FLORIDA WEATHER TESTING USED BY N. Y. LABORATORY

Because cloud interference is at a minimum there, an out-of-doors testing station has been set up in Miami, Florida, by Sam Tour & Co., Inc., of New York, for weather testing of materials and products. The maximum of actual exposure to rain, wind, and salt water as well as to intense sunshine, makes it possible to conduct weather exposure tests on a year round basis.

At Tour laboratories in New York City facilities are maintained for both outside and inside weather testing. Outside testing racks are set up on the roof of their building, while in the laboratory simulated weather conditions are secured by up-to-date equipment.

▼

MATHIESON CHEM. CORP. PURCHASES SOUTHERN ACID & SULPHUR CO.

The business and assets of Southern Acid & Sulphur Company, Inc., St. Louis, Missouri, have been purchased by Mathieson Chemical Corporation, New York City. Under terms of the agreement, Mathieson will distribute 265,000 shares of its authorized but unissued common stock to the common stockholders of Southern Acid.

Principal business of Southern Acid is the production and sale of sulphuric acid, ammonium phosphate, ammonium sulphate, phosphoric acid, superphosphates, mixed fertilizers, and sulphur, with plants located at Houston, Beaumont, and Port Arthur, Texas; Shreveport, Louisiana; and Little Rock, McKamie, and Macedonia, Arkansas. Acquisition of this company will further diversify the line of basic chemicals now manufactured by Mathieson, and will add to its present operations a business that is producing satisfactory earnings, the report to stockholders stated.

Two 84-in. Smith & Winchester Undercut Trimmers recently installed in the Everett (Wash.) mill of Weyerhaeuser Timber Co. for the accurate trimming of pulp on a production basis. These machines are equipped with power back gauge, two-hand starting and illuminated index tape. They are designed for accuracy, ease of operation, safety and high production

▼

CITATION TO SANDY HILL

The National Disabled American Veterans Citation has been awarded The Sandy Hill Iron and Brass Works, Inc., of Hudson Falls, New York, by the national office of the organization in conformance with recommendations of William (Slim) Vieley, Chapter 86, Disabled American Veterans of Glens Falls, New York.

Presentation of the citation will be made to the president of the company, Frank Juckett, at ceremonies at the second Progress Show of the William Vieley Chapter to be conducted May 5, 6, and 7 in the Glens Falls Armory.

Sandy Hill is the first corporation in northern New York to receive this honor.

▼

▶▶▶ A $500,000 PLANT expansion program was recently completed by the Lebanon Steel Foundry, Lebanon, Pennsylvania, doubling the company's high-alloy steel casting facilities. The new plant and equipment installations are specially designed for the production of super-alloy castings under secret processes developed by Firth-Vickers Stainless Steels, Ltd., leading British steel casting concern of Sheffield, England.

▼

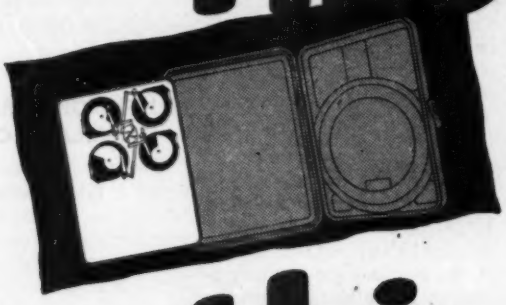
BROWN INSTRUMENT SCHOOL WILL CONTINUE INTO JUNE

Industrial instrument maintenance and repair courses, conducted for the past 15 years by Brown Instruments Division of Minneapolis-Honeywell Regulator Company, will be divided during the first six months this year into four classes of five weeks each, and longer courses for company personnel. In announcing the broadening of its instruction for the benefit of industry and its own personnel, M. J. Ladden, head instructor, made known that the courses will continue through to June 17, and will be sub-divided into specific classes for instruction in millivoltmeters, mechanical pyrometers, continuous balance electronic potentiometers, electrically operated automatic control, flow meters, thermometers, pressure gauges and hygrometers, air-operated control, Moist-o-Graphs, tachometers, resistance thermometers, CO_2 and analygraph.

▼

▶▶▶ A THREE-DAY sales meeting of national and Canadian sales representatives for Hardinge Company, Incorporated, was recently held at the home office in York, Pennsylvania. During the meeting a Hardinge 25-Year Club was formed, and 35 people were inducted; two of them were men with more than 50 years service. All employees with more than five years service received service pins.

you can have this



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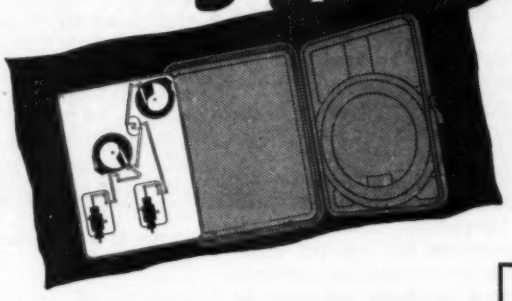


or 100,000 other instrument combinations
. . . with 4 circuits . . . 8 basic parts . . .

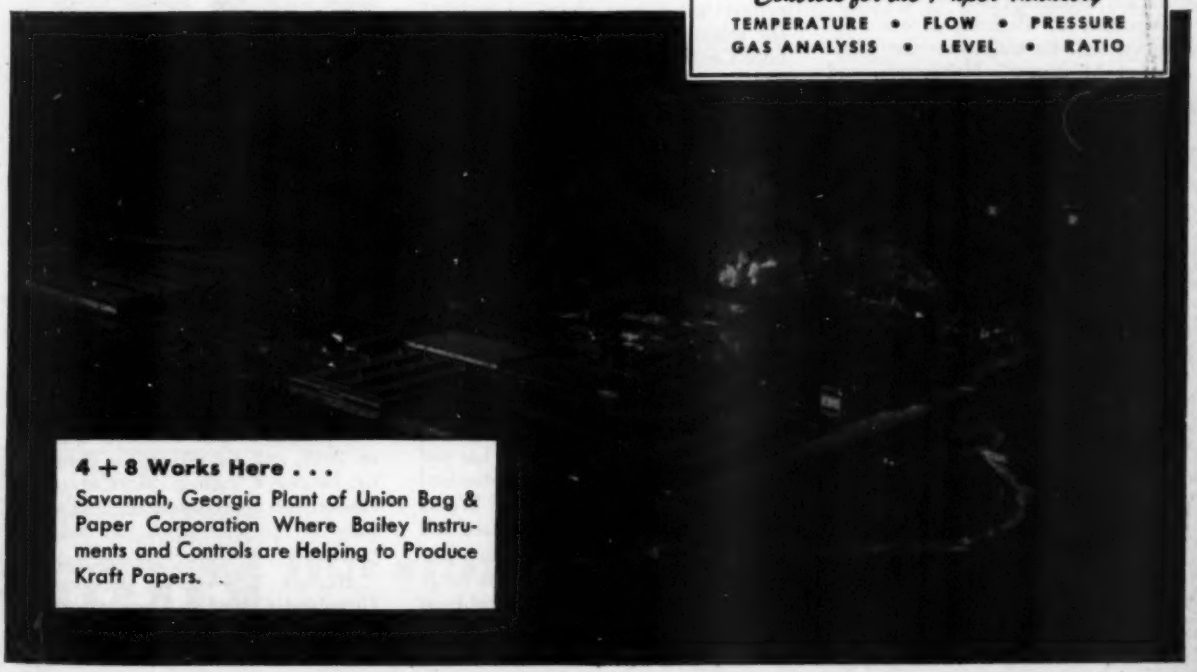
P-18-P

More than 100,000 different instrument combinations are now possible from four basic circuits and eight basic component parts. That's how Bailey has simplified electronic controls for processing industries.

No matter what your process may be, you can use Bailey controls for flow, temperature, pressure, level, speed, gas analysis, pH, conductivity, etc. Four circuits and eight basic parts are all you need. You don't have to carry a large stock of replacement parts. Bailey parts are interchangeable. The units you use for one control can quickly be adapted to another.

To learn how Bailey controls can save you money and speed up control installations, write for a copy of Bailey Bulletin No. 17.

BAILEY METER COMPANY
1058 Ivanhoe Rd. • Cleveland 10, Ohio
BAILEY METER CO. LIMITED, MONTREAL
Controls for the Paper Industry
TEMPERATURE • FLOW • PRESSURE
GAS ANALYSIS • LEVEL • RATIO



4 + 8 Works Here . . .
Savannah, Georgia Plant of Union Bag & Paper Corporation Where Bailey Instruments and Controls are Helping to Produce Kraft Papers.

R-S PRODUCTS COMPLETES TENTH ANNIV. OF RESEARCH UNDER PROF. W. S. PARDOE

At the close of a decade of R-S Valve research under the personal supervision of Professor W. S. Pardoe, University of Pennsylvania, the R-S Products Corporation, of Philadelphia, proudly announces that many improved valve designs have been the direct result of such research. It is further stated that "K" valves and torque coefficients have been developed for the entire line in addition to experimental tests which are constantly being conducted.

Professor Pardoe is held in high regard in the engineering field in this country.

Prof. W. S. Pardoe

Howard L. Murray

ASSETS OF H. BELFIELD CO. NOW OWNED BY MINNEAPOLIS-HONEYWELL REGULATOR CO.

Acquisition of the assets of the H. Belfield Company, Philadelphia, pioneers in the design of valves for the chemical and many other industries since 1836, has been announced by the Minneapolis-Honeywell Regulator Company, Minneapolis.

President of Belfield, Howard L. Murray, will be elected a vice president of Minneapolis-Honeywell, and will be in charge of the new acquisition to be known as the Belfield Valve Division of Minneapolis-Honeywell. All personnel of Belfield will continue with the company in their same capacities.

Belfield manufacture certain types of automatic control valves not previously made by Honeywell, and they will be applied to the automatic control systems made by Honeywell for use in heating and air conditioning installations. Distribution of Belfield products will be handled nationally and abroad through Honeywell branch offices and foreign subsidiaries.

▼

▶▶▶ INCREASED VOLUME of business has made it necessary that Link-Belt Company move its Spokane (Wash.) warehouse and district sales office to new, larger quarters. The new location is North 1303 Washington Street, Spokane 13.

▶▶▶ SINCE THE government's extension to 1967 of Diamond Alkali Company's lease on the Edgewood Arsenal plant at Edgewood, Maryland, (originally granted in 1946), the first expansion of facilities undertaken is well along. Present production of chlorine and caustic soda from Edgewood will be stepped up approximately 30% with completion of this additional capacity, now scheduled, for early Spring.

▼

▶▶▶ REPRESENTING The Sandusky Foundry & Machine Company, for the sale of its Sandusky Shower Pipes, Clark and Vicario Company, New York City, now has the territory east of the Rocky Mountains with the exception of all the New England states east of the Connecticut River.

▼

▶▶▶ A NEW PRODUCT Development Department has been formed by the American Cyanamid Company with George W. Russell as Manager. He will report directly to the company's vice president in charge of research and development. One of the functions of the new department will be to determine whether there are economic uses for selected products developed in the research laboratories, and for which sales applications are not yet established. Market research on currently manufactured products will also be conducted.

▼

▶▶▶ "PRINTING PROFITS," 16-mm. movie, in full color and sound, prepared specifically for showings to printers and lithographers, is scheduled for release this spring by Harris-Seybold Company, Cleveland, Ohio. Operating features of the Harris Model No. 122 offset press are shown, as well as the advantages of the lithographic process generally. The camera takes printers and lithographers into the mechanics of smoother inking, faster make-ready, higher speeds, and finer register, and points out the profits to be gained thereby.

▼

LARGE SULPHURIC ACID PLANT NOW IN OPERATION

What is claimed to be the largest single unit, sulphur burning, contact sulphuric acid plant ever built has just begun operation at The Standard Wholesale Phosphate and Acid Works in Baltimore, Maryland. Designed and built by Chemical Construction Corporation, a unit of American Cyanamid Company, the new plant is capable of producing 500 tons of sulphuric acid per day.

Operation consists of three basic steps: burning of sulphur to form sulphur dioxide; oxidation of the sulphur dioxide to sulphur trioxide; and finally the absorption of the sulphur trioxide in sulphuric acid. The second step involves the use of the Selden Vanadium Calalyst, an American Cyanamid product.

▼

McNEIL, OF AKRON, BUYS CLEVELAND CRANE & ENGR.

Outright purchase of The Cleveland Crane & Engineering Company, Wickliffe, Ohio, by The McNeil Machine & Engineering Company of Akron, Ohio, was announced February 4. There will be no change in over-all management, organization, or policies of Cleveland Crane, and for all practical purposes the name will remain the same. The only change contemplated is merging the two companies with the thought that later on stock of the combined companies will be offered to employees and the public.

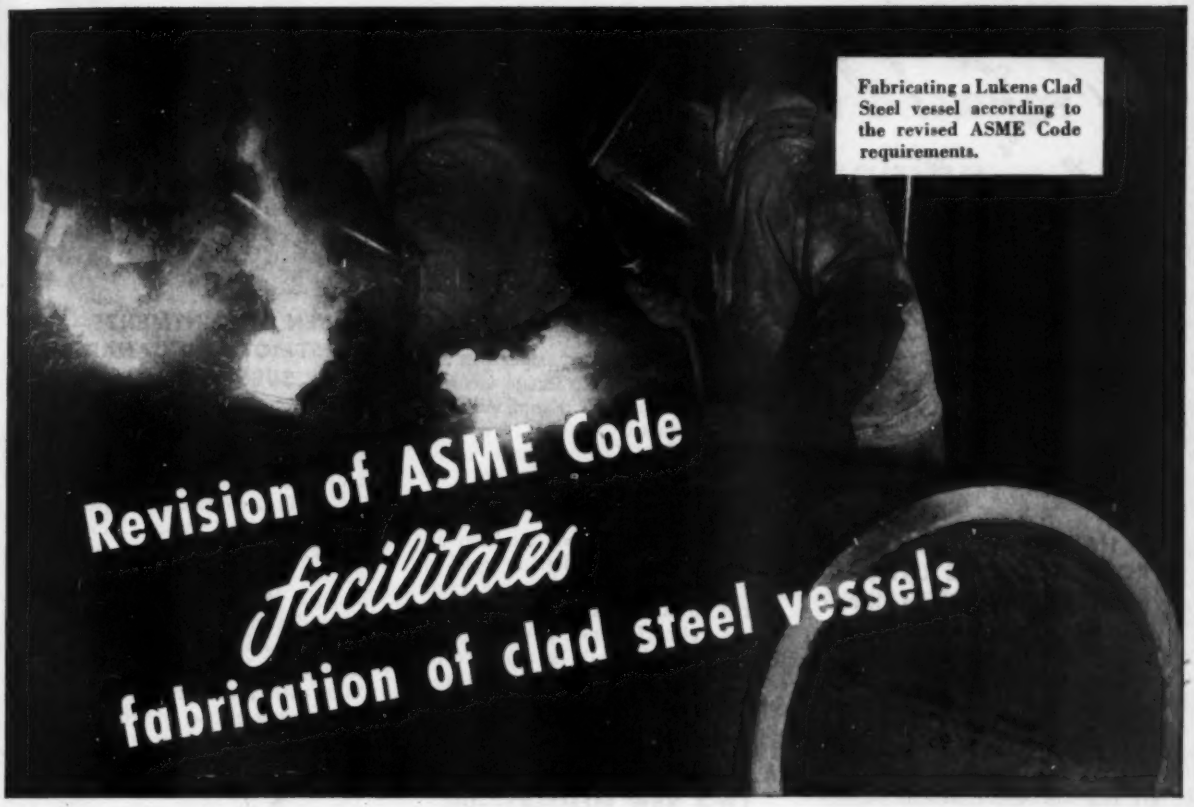
Because of the similarity in manufacturing facilities required for the products of the two companies, they have much in common. By combining efforts and resources and interchanging ideas and experiences one will be an asset to the other, enabling developments at a rate even greater than before.

C. F. Safreed

H. T. Florence

Since 1899 Cleveland Crane has been engaged in the manufacture of overhead traveling cranes, and has added since that time overhead materials handling equipment, press brakes, and a line of heavy metal cutting machines. McNeil, organized in 1862, originally made heating and power boilers, and in the early 1900's entered the paper and rubber machinery field. The present owners took over the firm in 1936, and since then the company has become a leading manufacturer of rubber-working machinery. The company is operated by C. T. Safreed, president.

Herbert T. Florence, president of Cleveland Crane, and executives now associated with him, will continue to operate the business as previously.



Fabricating a Lukens Clad Steel vessel according to the revised ASME Code requirements.

Revision of ASME Code *facilitates* fabrication of clad steel vessels

As announced recently in Mechanical Engineering, Case 896 of the ASME Code has been further revised. Rulings cover welding procedure and operator qualification requirements, with the result that, in many cases, the fabrication of clad steel equipment is facilitated and speeded up.

All-alloy welds can be used throughout the entire section of a clad steel shell where the small diameter, for example, makes this necessary. Materials meeting Specification SA-263, Grade A (Type 410) can be used without stress relief if the carbon content of the cladding is less than 0.08. Temperature limitations for certain types of clad metals have been modified.

Case 1078, covering the use of linings which are applicable to certain fittings—manways, nozzles and the like—is also now available for the first time.

For general information on Lukens Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad Steels, write for Bulletins 255 and 338. Lukens Steel Company, 408 Lukens Building, Coatesville, Pennsylvania.

CLAD METAL STEEL

LUKENS

Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
STEELS

SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

NAMES in the News

Douglas Nelson Smith Clark WHITE CLEVELAND Spaulding Arthur Wolf Morris Simpson Kraft Bryan Temple

PERSONALS

GEO. HAY, SR., RETIRES FROM RACQUETTE RIVER— 50 YEARS IN PAPERMAKING

After being associated with the papermaking industry for over 50 years, in Scotland and the United States, George Hay, Sr., retired January 29 from the Racquette River Paper Company, where he had been employed since 1932 as a boss papermaker.

Mr. Hay was born in Scotland, where his father was superintendent of a large paper plant. He entered the industry at the age of 13, and came to this country in 1907. Previous to his association with Racquette, he was boss foreman at the Oxford Paper Company, Rumford, Maine.

▼

3 NEW VICE PRESIDENTS ARE ELECTED BY UNION BAG

Three executives of Union Bag & Paper Corporation, New York City, have been elected vice presidents of the company:

Alexander Calder, Jr., has been assistant to the vice president in charge of sales.

James L. Knipe, a well-known economist, has been assistant to the president.

T. T. Dunn has been and will remain resident manager in charge of the company's pulp, paper, paper bag and paper box plant in Savannah, Georgia.

Mr. Calder and Mr. Knipe will have their headquarters in the New York office, and Mr. Dunn remains in Savannah.

▼

▸▸▸ *William Thomas* has been appointed technical adviser in research and development for moisture vapor barrier products at W. Ralston & Company's Raltex Laboratory, Old Bridge, New Jersey. He will be available for consultation with Ralston distributors or waterproof paper users.

▼

A. D. LITTLE BOARD HAS TWO NEW MEMBERS—DR. OLD AND PROF. SHERWOOD

The dean of engineering of Massachusetts Institute of Technology, Professor Thomas K. Sherwood, and Dr. Bruce S. Old of the staff of Arthur D. Little, Inc., recently were elected to the board of directors of Arthur D. Little, Inc., Cambridge, Massachusetts, research and engineering organization. R. C. Griffin retired as director and as assistant secretary of the company under their regular retirement plan.

Dean Sherwood is the author of many publications on chemical engineering subjects, and was with the Chemical Engineering Department of MIT for several years prior to his appointment as Dean in 1946. During the war, he worked with the National Defense Research Committee and other Government research groups, and was awarded the U. S. Medal for Merit in 1948.

Dr. Old, after leaving the U. S. Navy, where he served in the Office of Research and Invention with the rank of Commander, joined the Arthur D. Little staff in 1946. He is now in charge of process metallurgy there, and is also consultant to the Office of Naval Research and the Atomic Energy Commission, in the latter as Chief of Metallurgy and Materials Branch, Division of Research.

▼

TIMKEN APPOINTMENTS— DISTRICT AND CANADIAN SUBSIDIARY MANAGERS

The assistant district manager of Industrial Bearing Sales in the Cleveland office, Seward T. Salvage, has been made sales promotion manager of the Timken Roller Bearing Company, with headquarters in Canton, Ohio.

T. F. Rose, Cincinnati branch manager of Timken's Service Sales Division, has become manager of Timken Roller Bearing Service and Sales, Limited, Toronto, Ontario, which is the Canadian subsidiary of the Canton, Ohio, company. Mr. Rose's appointment followed the death of C. E. Webster, manager since 1930 of the Canadian subsidiary.

H. C. Telford, who was assistant manager of the Timken branch in Atlanta, Georgia, has become the new Cincinnati manager.

▼

MANDO ANNOUNCES TERRITORIAL CHANGES

Revisions of certain sales territories so that each territory will have its own headquarters was recently announced by the Paper Division of Minnesota and Ontario Paper Company, Minneapolis.

L. W. Newquist, who has represented Mando in the Southwest territory with headquarters in Minneapolis, has been transferred to St. Louis.

Jack Hall will represent the Chicago sales office under the supervision of Paul Joslin, manager.

Ray Strindmo, for several years chief clerk of the Minneapolis office, has been transferred to Kansas City as sales representative.

Alex. Calder, Jr.

James L. Knipe

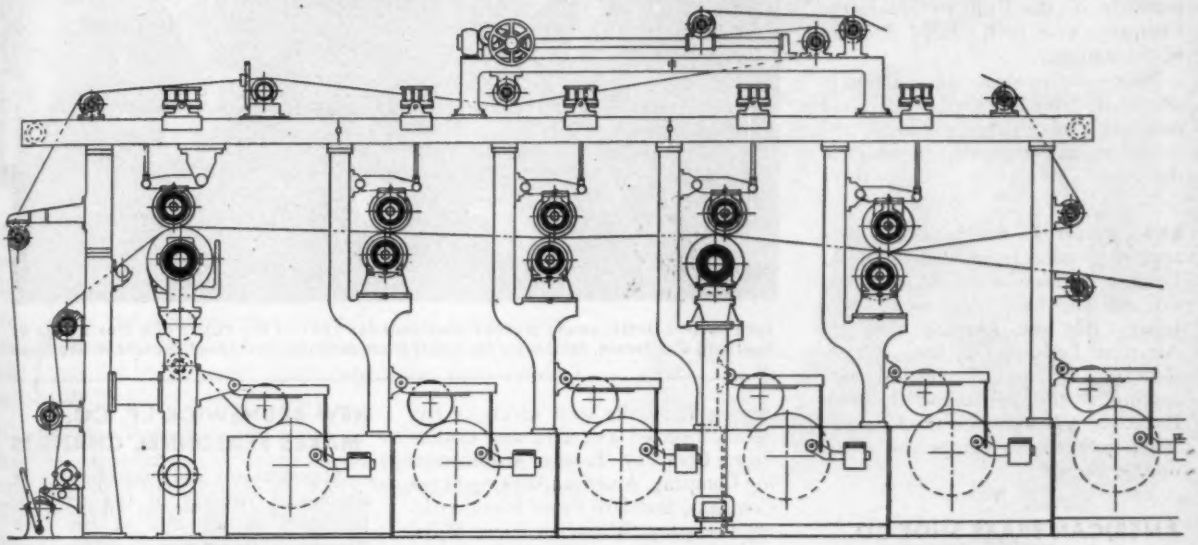
T. T. Dunn

L. W. Newquist

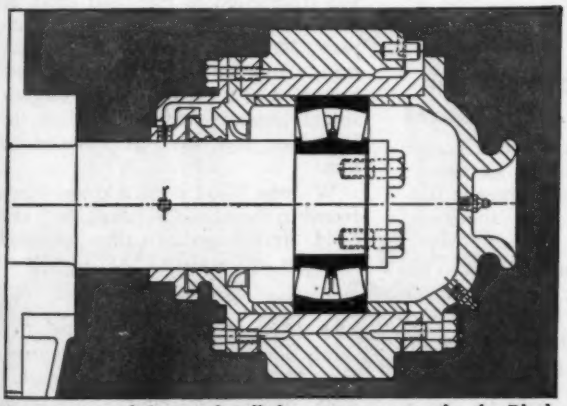
Jack Hall

Ray Strindmo

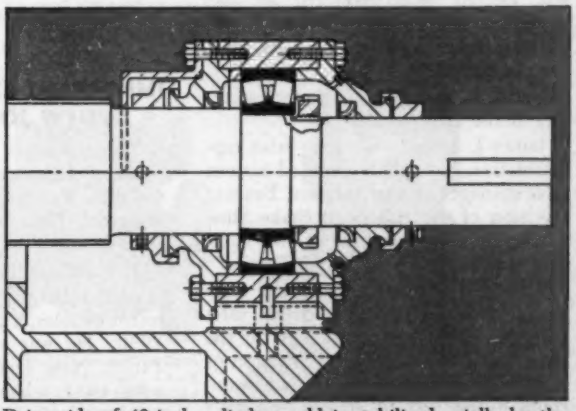
Black-Clawson specifies 183 Torrington Spherical Roller Bearings for new 154-inch Board Machine



Soon to be erected is the modern Black-Clawson 154-inch Board Machine shown here in elevation. Every roll visible—cylinder molds, couch rolls, upper and lower primary press rolls and wet felt rolls—will be equipped with Torrington Spherical Roller Bearings. Applications to parts of the machine not shown bring the total of Torrington Bearings specified to 183.



Cross-section of the couch roll shows one reason why the Black-Clawson Company specified Torrington Spherical Roller Bearings. Barrel-shaped rollers *align automatically* within outer race spherical bores. Result: getting proper alignment on paper machine frames is simple, despite 174-inch center distances.



Drive side of 42-inch cylinder mold is stabilized axially by the either-way thrust capacity of Spherical Roller Bearings. Full roller contact area is maintained under deflection or misalignment: free rotation is unimpaired. Long service life is secured with minimum maintenance attention.

To get smooth, reliable operation, long service life, low maintenance costs, specify Torrington Spherical Roller Bearings for *your* new equipment or replacements. Our engineers are always ready to work with you on your bearing requirements. Write us today. THE TORRINGTON COMPANY, South Bend 21, Ind., Torrington, Conn. District offices and distributors in principal cities.

TORRINGTON SPHERICAL ROLLER **BEARINGS**

Spherical Roller • Tapered Roller • Straight Roller

Needle • Ball • Needle Rollers

KATZ IS NEW SAN-NAP-PAK PRES.—AN EX-GOVERNOR & BANKER BECOME DIRECTORS

Emanuel Katz is the newly elected president of San-Nap-Pak Manufacturing Company, Inc., New York.

Ralph F. Gates, former Governor of Indiana, and Ernest S. Macdonald, vice president of the Bank of Manhattan Company, were both elected directors of the company.

This company owns three plants in which it produces paper pulp and makes its own paper products, and is one of the integrated companies in the field.

▼

▶▶▶ *Robert J. Berglund* has been appointed sales representative in the Lecithin Division of the W. A. Cleary Corporation, New Brunswick, New Jersey. He was formerly with the American Lecithin Co., Inc., Atlanta, Georgia. He studied chemical engineering at the Polytechnic Institute, Brooklyn, and was with the Chemical Warfare Service in Europe and Africa during the war.

▼

AMERICAN BRAKE SHOE CO. ANNOUNCES APPOINTMENTS

At the February meeting of the board of directors, Kempton Dunn was elected vice president of the American Brake Shoe Company. He will continue to serve as treasurer of the company.

Cyrus E. Brush was elected secretary at the same time.

James J. Nelson, formerly sales representative, has been appointed eastern sales manager of the National Bearing Division of the American Brake Shoe Company. Headquarters of this division are in Meadville, Pennsylvania.

Harry D. Sweeney has been promoted from sales engineer to sales manager of Welding Products for the American Manganese Steel Division of American Brake Shoe. He will continue to be located at the division's headquarters in Chicago Heights, Ill.

▼

CARL MAGNUS IS SUPT. OF PAPER MILL OPERATIONS MORAINE PAPER COMPANY

The appointment of Carl Magnus as superintendent of paper mill operations at the Moraine Paper Company, West Carrollton, Ohio, (subsidiary of American Envelope Company) became effective February 7.

Associated with the papermaking industry since 1915, and a graduate of the University of Maine, Mr. Magnus has had a broad association with the industry as a general consultant. Among the mills with which he has been connected are: Dill and Collins Paper Company, Eastern Manufacturing Company, American Writing Paper Company, Standard Paper Manufacturing Company, Waterfalls Paper Mills, and Wausau Paper Mills.

He is a member of both TAPPI and The American Pulp and Paper Mill Superintendents Association, having served as president of the latter for the year 1931-32.

Jack Leiser, (left), newly elected president for 1949 of the Paper Mill Men's Club of Southern California, Inc., receives gavel from outgoing president, Gerald N. Madigan

▼

IMPORTANT EXECUTIVES ARE IN NEW JOBS AT HERCULES

Three changes in key administrative posts of Hercules Powder Company's Cellulose Products Department at Wilmington, Delaware, were announced recently:

J. B. Wiesel became assistant to the general manager. He was formerly director of sales, a post he had held since 1930. He was superintendent of the Parlin, New Jersey, plant from 1921 until 1925, when he became technical service manager of the Cellulose Products Department. From 1940 to 1942, Mr. Wiesel was adviser to the chief of Protective and Technical Coating Section of the War Production Board. He has been primarily interested in promoting the use of lacquer, and is an active participant in the Paint, Varnish and Lacquer Association activities.

Carl W. Eurenius succeeds Mr. Wiesel as director of sales. He was formerly manager of the company's sales research division.

A. R. Olsen has been named manager of plastics promotion, and as such will be in charge of the promotion of cellulose acetate and ethyl cellulose in the plastics industry.

NEW BRUNSWICK I.P. CO. MAKES PERSONNEL CHANGES

Appointments and promotions were announced recently in the technical personnel of the mill of the New Brunswick International Paper Company, Dalhousie, New Brunswick.

R. T. Morgan became acting plant engineer, succeeding H. C. Lee, who was transferred to the head office of the Canadian International Paper Company, Montreal, Quebec. E. B. Hinman, acting mill superintendent, was promoted to the position of acting assistant general superintendent of the Dalhousie mill. Fred Mills succeeded him.

W. John Windebank also was transferred to the Montreal head office, and S. H. Smillie became acting personnel manager in his place.

▼

▶▶▶ *John J. Meadows, P. E.,* recently joined Sam Tour & Company, Inc., New York, engineers, metallurgists, and consultants, as supervisor of its Mechanical Engineering Department. Mr. Meadows has had thirty years' experience in electrical and mechanical engineering, and is the inventor of numerous devices that have been used by the Army and Navy.

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▶▶▶ *Edward E. Niederauer,* formerly assistant superintendent, has been appointed general superintendent of the Escanaba Paper Company, Escanaba, Michigan, to succeed R. W. Haddock, who retired recently (cf. P.I. and P.W., Feb., 1949). Mr. Niederauer has been employed with The Mead Corporation for 20 years. Escanaba Paper is an affiliate of The Mead Corporation.

Safeguard your Production Goal with POWELL VALVES

Probably the chief reason why American Industry leads the world in productivity is the practice of setting up production goals—and then achieving them.

Naturally the achievement depends, to a large extent, on the human element; but in this technological age the efficiency of equipment—and especially flow control equipment—plays a major part.

That's why Powell builds a line of valves to meet the specific requirements of every known industrial flow control service. Furthermore, in every valve, long life and dependability have been emphasized.

So, no matter what your flow control problems may be, Powell has the answers. Write for full information on applications of Powell Valves.

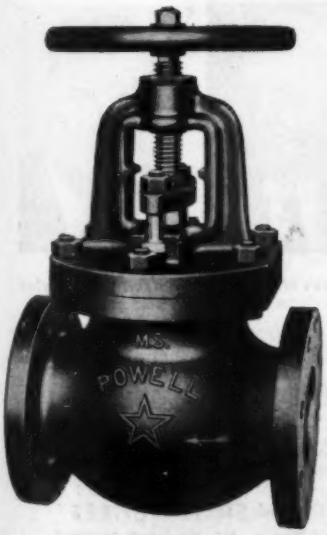


Fig. 241—Large 125-pound Iron Body Bronze Mounted Globe Valve. Made in sizes 2" to 16", inclusive. Has outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc.

Fig. 150—150-pound Bronze Globe Valve with screwed ends, union bonnet and renewable composition disc.

Fig. 559—125-pound Iron Body Bronze Mounted Swing Check Valve with flanged ends, bolted flanged cap and regrindable, renewable bronze seat and disc.

Fig. 1816—Large 125-pound All Iron Gate Valve. Made in sizes 2" to 30", incl. Has bolted flanged yoke, outside screw rising stem and tapered solid wedge.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

J. D. BROWN LEAVES I.P. CO., THREE RIVERS TO GO WITH SUTHERLAND REFINER

Word was recently received of the appointment of James D. Brown as sales engineer of Sutherland Refiner Corporation, Trenton, New Jersey. Formerly groundwood superintendent for a period of eight years of the International Paper Company at Three Rivers, Quebec, Ontario, Mr. Brown is known in the paper industry both in the United States and Canada. He has had 22 years' experience in mill operation and saleswork.

Prior to his joining Sutherland, Mr. Brown concentrated his efforts on the sale of stock preparation equipment.

James D. Brown

John B. Calkin

JOHN B. CALKIN IS NOW ON STAFF OF MAINE UNIVERSITY

According to a recent announcement by Dr. Arthur A. Hauck, president of the University of Maine, John B. Calkin, New York, has been appointed director of the Department of Industrial Co-operation, and associate professor of chemical engineering at the University.

Professor Lyle Jenness, who has been acting director of the Department of Industrial Co-operation, will devote his full time to his duties as head of the department of chemical engineering.

During 1943-48, Mr. Calkin was coordinator of research for the Union Bag and Paper Corporation. His earlier connections with industrial concerns in engineering and research were with the Dennison Manufacturing Company of Framingham, Massachusetts, and the Brown Company, of Berlin, New Hampshire. Recently Mr. Calkin established himself in New York as a consultant to the pulp and paper and chemical process industries, and will continue to maintain offices at 500 Fifth Avenue, New York City.

Mr. Calkin was graduated from Haverford College in 1926 and received a master's degree in chemistry from Haverford in 1927. In 1928 he was awarded a master of science degree in chemical engineering at the University of Maine, where he served as a teaching fellow. He also studied under-graduate fellowships at Massachusetts Institute of Technology and at Cornell University.

Mr. Calkin is identified with a large number of national technical organizations including the Technical Association of the Pulp and Paper Industry.

▼

FERGUS OF S. D. WARREN GOES TO CINCINNATI—IS WITH JOHNSTON PAPER CO.

A former district sales manager of the S. D. Warren Company (Cumberland Mills, Maine), James C. Fergus, has joined the Johnston Paper Company, Cincinnati, as secretary and sales manager.

John B. Strobridge, formerly secretary and sales manager of the company, has become vice president.

Both of these appointments followed the resignation of Edward H. Vollmer, a vice president and director of the company, who will engage in the paper business in Florida.

▼

▶▶▶ *Herman Liberman's* promotion to field engineer of Paisley Products, Inc., New York and Chicago, was recently announced. He will specialize in the company's line of nonwarp and flexible animal glues. He is considered to be an authority on the servicing and adjusting of animal glue adhesives as they apply to the printing and paper box manufacturing and converting industries.

▼

▶▶▶ *Luther V. Thiel* of Franklin, Ohio, has joined the staff of F. C. Huyck & Sons, Albany, New York, as a papermaker felt sales representative in the Middle West. He was formerly employed by Shartle Bros. Machine Company for 22 years as an engineer and salesman.

▼

BENEDICT TRANSFERRED BY WESTINGHOUSE—MANAGER HEADQUARTERS ENGINEERING

The new manager of the headquarters Engineering Departments of the Westinghouse Electric Corporation is F. R. Benedict, who was formerly manager of its Industry Engineering Department.

In his new position, Mr. Benedict will be responsible for the operations of the industry engineering, the foreign engineering, and the engineering laboratories and standards departments. While employed in the company's High Voltage Laboratory some years ago, he helped develop the high-voltage cathode-ray oscillograph used to measure lightning currents and voltages in a fraction of a second.

RALPH JOHNSON IS A VICE PRES.—NEW DUTIES ASSIGNED BY NORTON CO.

Ralph M. Johnson of the Norton Company, Worcester, Massachusetts, has been appointed vice president in charge of sales. He was formerly vice president and general sales manager of the abrasive division, and has been a director of the company since 1946. He is also a director of the Behr-Manning Company of Troy, New York, a Norton affiliate.

In addition to his former duties, Mr. Johnson's responsibilities will now include the sales of abrasive grain and ore, pulpstones, refractories, *Norbide* products, nonslip floors, as well as all publicity of these products.

▼

LATIMER QUITS WALDRON—NOW WITH MOORE & WHITE

The appointment of Thomas H. Latimer as chief engineer of The Moore & White Company, Philadelphia, has been announced.

Mr. Latimer formerly was vice president and chief engineer of the John Waldron Corporation, New Brunswick, New Jersey. At one time he was also chief engineer for The Black-Clawson Company, Hamilton, Ohio.

Thomas H. Latimer

Wilson W. Wheeler

▶▶▶ *Wilson W. Wheeler* has been appointed sales manager of the Askania Regulator Company, Chicago. He joined the company in 1941 and since 1945 has been head of the sales engineering department.

▼

FOREMAN SMITH RETIRES AFTER 47 YEARS WITH RACQUETTE RIVER CO.

After 47 years of continuous service, Thomas J. Smith has retired as foreman in the finishing room of the Racquette River Paper Company, Potsdam, New York. Company officials highly commended his long record of efficient and faithful service.

Reminiscing over the early years at the plant, Mr. Smith spoke of a wooden mill with two paper machines. His finishing department was in the same

AA-102

IMPORTANT NOTICE

TO ALL OWNERS AND OPERATORS OF *Camachine* MILL TYPE WINDERS

PNEUMATIC PRESSURE CONTROL

a Spectacular Improvement

IN CUTTER WHEEL PERFORMANCE

is now available for application to all existing mill type Camachines, both standard and narrow width. This cutter unit has also been adopted as standard on all new Camachine mill type winders (models 14, 18, 19 and 20).

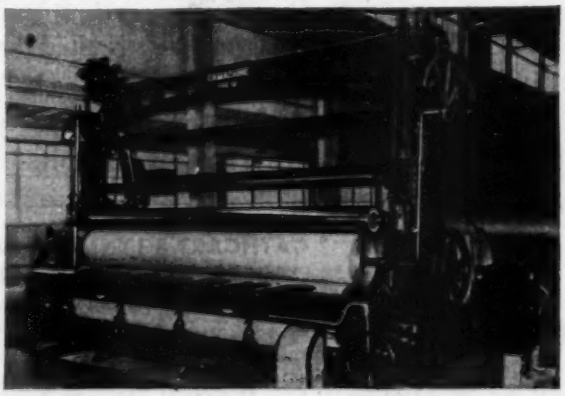
HERE'S WHAT IT DOES: With the new Camachine Pneumatic Cutter Units, uniform pressure is maintained on the complete set of cutter wheels, regardless of how many units are operated at the same time, and regardless of variations in the diameters of the cutter wheels. Also, the pressure is set and controlled at one point for the entire line, eliminating the need for individual adjustment of each cutter unit.

Pneumatic pressure control eliminates the danger of applying excess pressure on the individual unit—a fault which, on old-style spring-loaded cutters, often resulted in excess wear on the cutter wheels and costly downtime due to spring breakages.

Pressure on the entire line is controlled through a hand-operated valve. Changes of pressure to accommodate different thicknesses of paper or paperboard can be made instantly through a simple turn of the valve. In the event of a web break the cutter wheel pressure is released at once.

The Camachine Pneumatic Cutter Unit is one of several important post-war improvements which are offered as standard equipment on all new mill type Camachines. The extensive engineering, research and manufacturing facilities of the Cameron Machine Company are devoted exclusively to producing the world's most efficient slitting and roll-winding equipment.

BELOW: Camachine 20. Speeds up to 5000 fpm on newsprint.



Write for literature

Camachines

FOR FAST, TOP QUALITY ROLL PRODUCTION

. . . the world over

CAMERON MACHINE COMPANY • 61 POPLAR STREET • BROOKLYN 2, N. Y.

building where paper from the machines was cut into sheets, counted, sorted, and packed in rope-tied bundles, or else was rewound into various sized rolls and wrapped for shipment.

▼

▶▶▶ *W. A. Robinson* has resigned his position as technical director of the Cia. Industrial de Atenquique in Atenquique, Mexico, to accept a position with Fibreboard Products, Inc., at East Antioch, California.

▼

▶▶▶ *Dr. Kenneth G. Booth,* a 1948 graduate of McGill University, is a new member of the central research and technical department at the Crown Zellerbach plant in Camas, Washington.

▼

▶▶▶ *George H. Cordes* is now New York sales representative of Crocker-McElwain Company. He was formerly with Jessup-Moore Paper Company, Philadelphia.

▼

▶▶▶ *Anton Neuburger* recently resigned from the sales force of American Writing Paper Corporation. He became associated with AWP in 1946. Mr. Neuburger has not announced his plans for the future.

▼

▶▶▶ *Lawson Turcott,* of Bellingham, Washington, the president of the Ketchikan Pulp and Timber Company (Alaska project—cf PI & PW, Feb. '49) has been named to a Seattle, Washington, Chamber of Commerce "railroad to Alaska" committee. The group will promote such a project.

▼

▶▶▶ *George C. Winlow,* a director of the E. B. Eddy Company, Ottawa, Ontario, Canada, and director of sales, recently retired due to ill health. Mr. Winlow celebrated the fiftieth anniversary of his entry into the paper industry in 1944.

▼

▶▶▶ *Quentin Graham* was recently elected vice president of the Elliott Company, Jeannette, Pennsylvania. He joined the company as manager of the electrical engineering department in 1944.

▼

▶▶▶ *Foster Dee Snell,* president of Foster D. Snell, Inc., New York, has been named by unanimous vote of the council of the Society of Chemical Industry, London, to receive the Society's Gold Medal for 1949. The medal is awarded bi-annually to a person "who has attained eminence in applied chemistry," and Dr. Snell is only the second American to receive the medal, first awarded in 1896. The Society is a world wide organization with headquarters in London, and with sections in the United States, Canada, and Australia.

▼

▶▶▶ *E. F. Miles,* formerly New York sales representative for Crocker-McElwain Company, has taken the position of New England sales manager for Missisquoi Paper Company, St. Albans, Vermont.

▼

▶▶▶ *J. H. Oakes* has been appointed as sales manager, Enclosed Drives, of the Link-Belt Company, Chicago. His headquarters will be at the company's Philadelphia plant.

Harry F. Kurz will assist him as representative, Enclosed Drives, with headquarters at the Pershing Road plant in Chicago.

▼

▶▶▶ *I. N. Kimsey* has moved up from manager of the Akron district to field sales manager of the Industrial Products Sales department of the B. F. Goodrich Company. *John M. Cooney,* manager of the Boston district for B. F. Goodrich Company, has taken Mr. Kimsey's place as manager of the Akron district.

▼

▶▶▶ *D. Samuel Gottesman* of New York has been elected to the board of directors of Rayonier, Incorporated. Mr. Gottesman is president of Gottesman & Company, Inc., and has been associated with the wood pulp and paper industry since 1899. He is also president of Central National Corporation, and is a director of Eastern Corporation.

▼

▶▶▶ *Miles K. Smith* has been appointed vice president and technical director of Jessop Steel Company, Washington, Pennsylvania. He was formerly with Molybdenum Corporation of America in a technical sales capacity, and for many years with Latrobe Electric Steel Company.

▼

▶▶▶ *M. E. Barthen,* general superintendent of the Carton Division of The Ohio Boxboard Company, Rittman, Ohio, has been promoted to the position of assistant to the president.

J. M. Kernan succeeds Mr. Barthen as head of the Carton Division.

▼

▶▶▶ *S. E. Chamberlin,* vice president, was recently placed in charge of all fine paper operations of the Graham Paper Company, St. Louis, Missouri. He succeeds P. A. Harris, who has retired after 42 years service with the company. Hereafter Mr. Chamberlin will direct Graham's operations in bond and writing, cardboard, envelope, and stationery. For the past year he has been in charge of the merchandising of book paper, cover paper, and newsprint.

▼

▶▶▶ *R. N. Wallis* (assistant treasurer, Dennison Manufacturing Company, Framingham, Massachusetts) has been appointed by the Controllers Institute of America to serve on the membership committee for the Controllership Foundation. This is the research arm of the Institute and conducts surveys and studies in the financial management field.

▼

▶▶▶ *Oscar Clouser* has retired from service as quality supervisor for the Hammermill Paper Company at the age of 75. He had completed 34 years of service with the company, having been an employee since 1915. He was a beater engineer in the paper mill for many years, becoming a foreman in the beater room in 1933, and two years later was advanced to the position of quality supervisor.

▼

▶▶▶ *A. Welch* has been appointed to succeed George C. Winlow (who retired because of ill health) as general manager of the E. B. Eddy Company, Ottawa, Ontario, Canada. Mr. Welch was formerly general manager of the Sidney Roofing and Paper Company, Ltd., Victoria, British Columbia, and he will continue as a director of that company.

▼

▶▶▶ *Dr. Thomas H. Daugherty* has been named assistant director of research for Calgon, Inc., Pittsburgh. He will be in immediate charge of research and development projects, serving as co-ordinator of development work in the application of "Calgon."

C. E. Kaufman was appointed assistant director of chemical research of Hall Laboratories, Inc., an affiliate of Calgon, at the same time.

▼

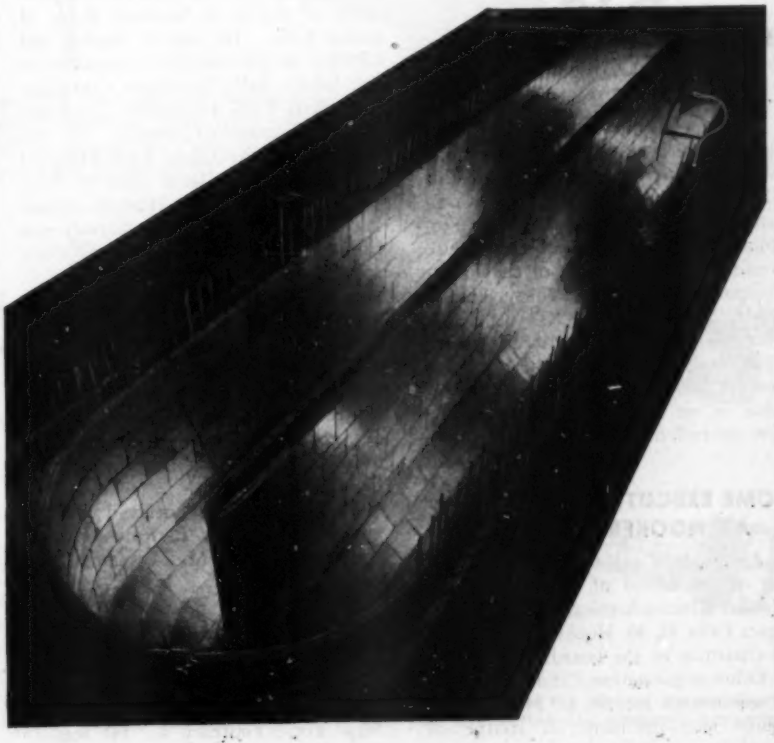
CATHCART & LYNN GET NEW POSTS WITH ROBT. GAIR CO.

Appointment of Thomas E. Cathcart, Jr., as New England sales manager for folding cartons was recently announced by Robert Gair Company, Inc., New York, New York. In this capacity, he will be primarily interested in sales activities for the folding carton

One of the Many Uses for KALAMAZOO Glazed Tile

Tanks Can Be Made to Any Design

with sloping floors and rounded corners. The ideal material for stock tanks or chests because of its permanent, long-lasting, easy-to-keep-clean surface. Far superior to concrete because there is no chipping or flaking. Standard construction in most modern paper mills.



Here is a Kalamazoo Glazed Tile chest in process of construction. It is built of smooth Kalamazoo Glazed tile with a solid, reinforced concrete core and designed for the installation of deckers on top.

Kalamazoo Tank and Silo Company

Kalamazoo 16, Michigan

operations at the Natick and Thames River divisions.

Alan Grayson Lynn has been appointed assistant to J. D. Malcolmson, director of Products Development at the Gair Company, and will conduct packaging surveys in customers' plants. Mr. Lynn has had 20 years' experience in the packaging field.

▼

BOEHM, THEOBALD & CAREY PROMOTED AT MATHIESON

Three recent changes in personnel at the Mathieson Chemical Corporation follow:

Roland F. Boehm has been transferred to the ammonia department in the New York offices of the company from his position as district sales manager of the Houston, Texas, office.

O. J. Theobald, Jr., formerly district sales manager of its Charlotte, North Carolina, office, replaces Mr. Boehm in the Houston office.

J. F. Carey, formerly a sales representative in the Charlotte territory, has taken over as district sales manager of the Charlotte office.

▼

FROM ELLIOTT CO. FRANK STOHR GOES TO ALLIS-CHALMERS, NORWOOD, O.

Announcement was recently made of the appointment of Frank H. Stohr to the post of general manager of Allis-Chalmers Manufacturing Company's Norwood, Ohio, Works. Previously Mr. Stohr was executive vice president and a director of the Elliott Company of Jeannette, Pennsylvania.

Mr. Stohr succeeds R. W. Davis, who has been general manager since 1944, and a member of the organization for 40 years. Mr. Davis will continue in an advisory capacity to the new general manager.

▼

SOME EXECUTIVES MOVE UP AT HOOKER ELECTRO. CO.

Although he will continue as a member of the board of directors of the Hooker Electrochemical Company, Niagara Falls, H. M. Hooker has resigned as chairman of the board.

Other organizational changes recently announced are: R. L. Murray, formerly vice president in charge of development and research, is now executive vice president; R. W. Hooker, vice president and sales manager, is now vice president in charge of sales; J. H. Babcock, formerly manager of development and research, has been appointed director in full charge of activities of that department; R. E. Wilkin moves up from eastern sales manager to general sales manager.

▶▶▶ *Ralph G. Harmon,* formerly a sales engineer in the Chicago office of The Timken Roller Bearing Company, of Canton, Ohio, has become district manager of the company's Industrial and Steel and Tube Divisions in Birmingham, Alabama. He replaces F. B. Carney who resigned.

▶▶▶ *R. S. Updyke* was recently appointed general manager of the Milwaukee operations of the Gaylord Container Corporation.

Glen B. Elliott became sales manager at the same time.

Emil Fredericks was made plant superintendent.

NECROLOGY

MAURICE HOOPES

The retirement of Maurice Hoopes, president of Finch, Pruyn and Company, Inc., Glens Falls, New York, was announced at the company's annual meeting on January 10. (Cf. P.I. and P.W., February, 1949.) Mr. Hoopes passed away Tuesday, February 15, at his home in Glens Falls.

Mr. Hoopes was also chairman of the board of directors and former president of the First National Bank of Glens Falls. He was a director and member of the executive committee of the Glens Falls Insurance Company, the Glens Falls Indemnity Company, and the Commerce Company. He was president of the Glens Falls Hospital board of directors from 1920 to 1924.

On January 10, Mr. Hoopes' son-in-law, Lyman A. Beeman, a former vice president of the St. Regis Paper Company, was elected president of Finch, Pruyn and Company, Inc., to succeed Mr. Hoopes.

He was at one time a director of the Adirondack Power and Light Corporation, a forerunner of the New York Power and Light Corporation. He was also at one time a director of the Sagamore Club at Bolton Landing-on-Lake George.

Mr. Hoopes is survived by his widow, Mrs. Mary E. Pruyn Hoopes and one daughter, Mrs. Lyman A. Beeman.

▼

WILLIAM G. MacNAUGHTON

Widely known as an authority on paper manufacture, William G. MacNaughton passed away at Yonkers, New York, February 4. He was 75 years old.

Born on a farm in Hinchinbrooke, Huntingdon County, Quebec, in 1874, he attended the local country school and matriculated for college from Huntingdon Academy in 1893. After teaching school for three years, the latter two as principal of Shawville Academy, Quebec, he entered McGill University in 1897 and was graduated in 1901 with a B.A., first class honors, and the Sir W. E. Logan Gold Medal in Natural Sciences. In 1904 he received his B.S. in Chemistry.

His professional career started in 1902, when he joined the Canada Paper Company at Windsor Mills, Quebec. In 1904, upon graduation, he took a position as chemist at the Canadian Rubber Company, Montreal, where he remained until 1908 when he entered the paper industry as chemist for Nekoosa-Edwards Paper Company, later becoming supervisor of the pulp and paper mills of that company. During this period he became one of the group that founded the Technical Association of the Pulp and Paper Industry. He was then also a member of the advisory committee of the Groundwood Research Laboratory of Forest Products which had been established at Wausau, Wisconsin.

From 1917 to 1920 Mr. MacNaughton was vice president and manager of the Inland Empire Paper Company at Spokane, Washington, and for a brief period in 1920 and 1921 he was at Kapuskasing, Ontario, during the initial development of the Spruce Falls Paper and Power Company. Later in 1921 he was appointed Secretary of the Technical Association of the Pulp and Paper Industry where he remained until 1927 when he joined the Newsprint Service Bureau as Engineer.

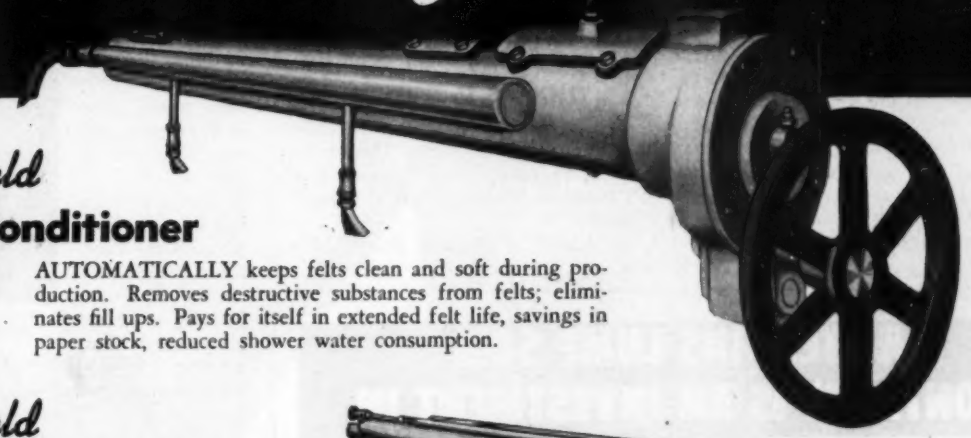
From 1929 to 1933 he was associated with the International Paper Company in the manufacturing department, New York, and for the next four years, until 1936, he was assistant director of Savannah Pulp and Paper Laboratory, established by the late Dr. Charles H. Herty for the investigation of the possibilities of southern pine for white papers, particularly newsprint. Besides the extension of knowledge regarding the papermaking resources of the southern states, a definite result of his investigation was the establishment in 1938 of a newsprint mill at Lufkin, Texas.

In 1936, with the completion of his work at Savannah, he returned to the Newsprint Service Bureau as engineer, which position he held at the time of his death. He was an active member of TAPPI and was the recipient in 1946 of the gold medal awarded each year by the Association for outstanding contributions to the pulp and paper in-

Speed Up Output
Cut Costs Per Ton

Soft, Clean Felts All the Time

The Scofield Way



Scofield
Felt Conditioner

AUTOMATICALLY keeps felts clean and soft during production. Removes destructive substances from felts; eliminates fill ups. Pays for itself in extended felt life, savings in paper stock, reduced shower water consumption.

Scofield
Venturi Throat Suction

PRODUCES highly superior method of vacuum extraction, without pinching pull on felt or destruction of nap. Long-wearing Monel metal bars eliminate frequent resurfacing and replacement of suction box covers.

Scofield
Wire Cleaner

FLUSHES wires and cylinder moulds with a forceful spray of steam and water, accurately controllable in temperature, density and velocity. Hand wheel control permits application at any point across width of machine.

Like all the Sandy Hill products, Scofield equipment is designed and built to the highest standards of precision and quality. Let us show you how they can fit into your production and economic program.

Sandy Hill Iron & Brass Works

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Manufacturers of

Adjustable Cylinder Vats
Cylinder Paper Machines
Pulp Grinders
Dandy Roll Drives

Machinists and Founders Specializing in Paper and Pulp Mill Machinery.

Pulpers or Kneaders, Voith
Thickeners
Quick Opening Gate Valves
Bertrams Flow Distributors
Bertrams Shakes
Neilson Slice
Feltless Wet Machines
"Selective" and Corner Drives
Fourdrinier Paper Machines
"Packer" Screens
Castings
Bleaching Equipment
Scofield Felt Conditioners
Cleveland Type Bearings
Shaker Screens

dustry. He was chairman of the Engineering Division as well as chairman of the Textbook Revision Advisory Committee under the Joint Textbook Executive Committee.

Mr. MacNaughton had traveled widely, having visited most of the pulp and paper mills of this continent as well as those in England, Norway and Sweden.

He is survived by two sons and two daughters.

▼

EDWARD F. MARSHALL

Retired general manager of the St. Regis Paper Company mills at Deferiet, Harrisville, and Norfolk, New York, Edward F. Marshall passed on February 3, at Orlando, Florida, where he and Mrs. Marshall had been spending the winter. He was 61 years of age.

Mr. Marshall had been an employee of the St. Regis Company for 31 years, having joined the company April 3, 1917, as a machine tender at the Deferiet mill. He spent the early part of his paper manufacturing career in mills at Carthage, Newton Falls, and Bellows Falls, Vermont.

In 1927, he was elevated to boss machine tender at Deferiet, and in 1934 became assistant superintendent of the mill. Early in 1935, Mr. Marshall was appointed superintendent of the Deferiet mill. He had served in that capacity for four years when he was promoted to general superintendent of the three aforementioned mills. He became general manager in 1944, and served in this position until his retirement last July.

▼

HARRISON NEWELL

An engineer with the American Writing Paper Corporation for 28 years, Harrison Newell passed away February 13, at Holyoke, Massachusetts. He was a descendant of Elder William Brewster, first Pilgrim minister, and of William Whipple, a signer of the Declaration of Independence.

Born in Boston, Mr. Newell was educated in Scotland, and served as a merchant marine engineer for several shipping concerns before joining the paper concern. Surviving him are his widow and two daughters.

▼

THOMAS C. BOWEN

Formerly an executive of paper mills in western Massachusetts, Thomas C. Bowen, 63, passed away February 1, at his home in West Springfield, Massachusetts.

A native of Browns Point, New York, Mr. Owen entered the papermaking industry with the Ticonderoga Paper and Pulp Company. Later he joined the Strathmore Paper Company and was superintendent of that company's mills in Woronoco, Massachusetts, before becoming assistant production manager of the company's four mills in Woronoco and West Springfield.

After leaving Strathmore, he served for two years as vice president of the Rising Paper Company in Housatonic, Massachusetts. Later, he joined the American Writing Paper Corporation where he had charge of four divisions. He retired two years ago owing to ill health.

▼

PAUL FIELDEN

On February 6, Paul Fielden, director of purchases of Norton Company, Worcester, Massachusetts, and former president of the National Association of Credit Men, passed away in Worcester. He was 62 years of age.

Paul Fielden

Mr. Fielden had been associated with the Norton Company for almost 30 years, joining it as assistant credit manager in 1919. In 1929, he became credit manager, and was named director of purchases in 1941.

Widely known in credit circles, he was formerly a vice president and director of the National Association of Credit Men prior to his election to the presidency in 1937.

▼

▶▶▶ *Edwin H. Distin,* one of the founders of the Kalamazoo Paper Box Company of Kalamazoo, Michigan, passed away recently. He was president of the firm for 40 years. Mr. Distin was born in Ludington, Michigan.

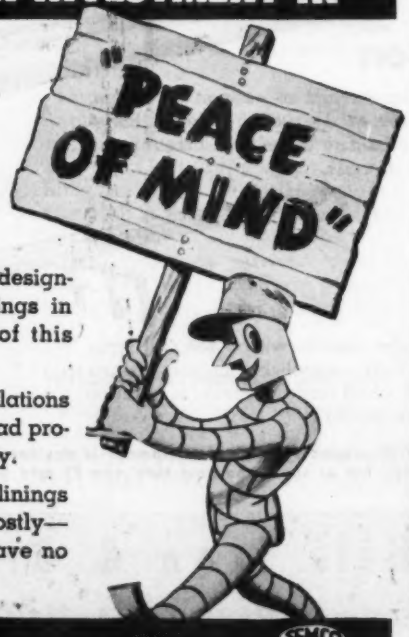
▼

H. J. WEBB

Former vice president and secretary-treasurer of the Bathurst Power and Paper Company, Montreal, H. J. Webb passed away recently at the Royal Victoria Hospital in Montreal, at the age of 68.

Born in England, Mr. Webb came to Canada in 1910, and was associated with the Riodon Company and the Canadian International Paper Company before becoming vice president and secretary-treasurer of the Bathurst Company in 1936. He retired last year. He is survived by his widow.

A STEBBINS LUMP SUM CONTRACT IS AN INVESTMENT IN



WHETHER the contract covers one chest or tank lining, or all the corrosion or alkali resistant linings for the entire mill, it is Stebbins responsibility to provide a dependable and satisfactory job that assures continuous operation.

Sixty-four years experience in designing, installing and servicing linings in pulp and paper mills is back of this contract.

Thousands of successful installations located on this continent and abroad provide tangible evidence of reliability.

Think twice before investing in linings —the wrong one can prove very costly— be safe, specify Stebbins—and have no regrets.

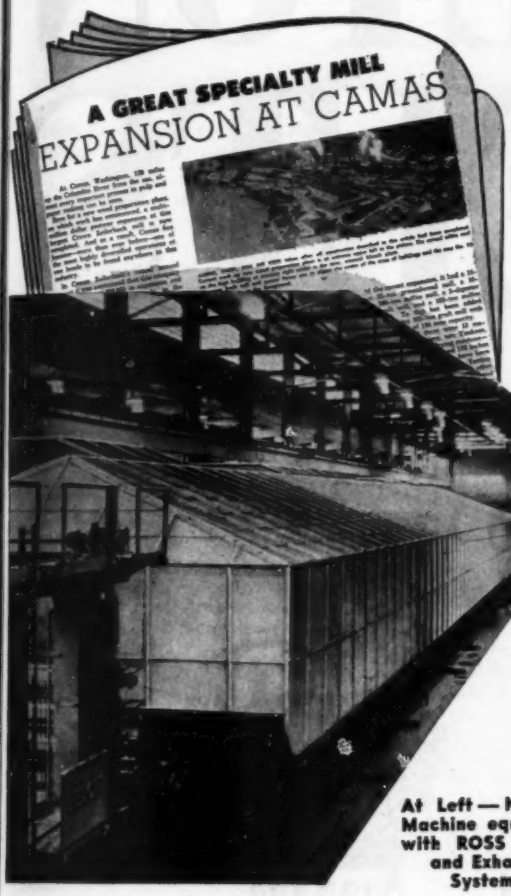
SEMCO

Stebbins Engineering and Manufacturing Company

EASTERN BOULEVARD, WATERTOWN, NEW YORK

For Both Of The New Machines At *CAMAS*

CROWN-ZELLERBACH *selected*



ROSS
Air Systems

At Left — No. 15 Machine equipped with ROSS Hood and Exhaust System.

Above: No. 14 Tissue Machine equipped with ROSS Hood and Vapor Absorption System.

Another notable expansion and modernization program completed and again ROSS Systems are cast to play a leading role. At the Camas Mill, the industry's most diversified producer, ROSS Systems include Hoods for both machines as well as for Kraft bleach plant washers; Yankee Vapor Absorption System and complete Machine Room Heating and Ventilating equipment. The most efficient utilization of air for processing in one of the largest specialty mills in the world.

ROSS SYSTEMS

J. O. ROSS ENGINEERING CORPORATION

MANUFACTURERS OF AIR PROCESSING SYSTEMS

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APPLETON FELTS

forward in the march of progress

FOR INCREASING PRODUCTION OF GOOD PAPER . . . .

APPLETON WOOLEN MILLS

APPLETON · WISCONSIN

Practical SHORTS

Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

High Friction Belts Should Never Be Overloaded

Careful belt operators see to it that belts are kept nice and pliable all the time in order that they will grip the pulleys easily and run properly without slipping. Proper treatment of a belt will do this. Slack, easy-running belts are always desirable where possible because of the lower initial tension and reduced bearing pressure.

However, there is one outstanding objection to the slack belt, and that is: users are likely to overload such belts. Most users of belts seem to think that when a belt is running slack it isn't pulling full load. It doesn't look just right for one side almost to touch the other. We have become so accustomed to tight belts and high initial tensions that we cannot rid ourselves of the idea readily. So, when the time comes to increase capacity or load, the operator of the slack belt says, "Well, this belt handled the old load so easily that I am sure it can handle a great deal more, therefore we won't buy a new belt."

But such reasoning is all wrong. A given belt cannot stand up to more than a definite stress day in and day out and year in and year out. Stress that is too great will quickly stretch the belt and ruin it. It will break prematurely. Treating a belt does not always make it stronger. It simply makes the belt more pliable, waterproof, and longer lived, and increases its coefficient of friction. The same rules that are used when computing untreated or ordinary belts should be used when computing the treated high-friction ones. The belt will then be amply strong and in most cases (though not always) a truly high-friction belt can be run slack. In every case, a high-grade belt of that type can be run "easy" at least.

Here is the rule of thumb that is most commonly used for 1-ply leather belts, because it is usually well within the limits of safety:

"A single-ply belt, 1 in. wide, running at the speed of 800 fpm, will transmit one horsepower."

And for 2-ply leather belts the rule of thumb is:

"A 2-ply belt, 1 in. wide, running at a speed of 500 fpm, will transmit the same—one horsepower."

—W. F. SCHAPHORST, M. E.

▼

Inspection Covers that Are Transparent

It is believed that the Electric Department of Nekoosa-Edwards Paper Company, Nekoosa, Wis., has developed a new, a practical use for Plexiglas—transparent inspection covers for various motors throughout the mills. The installation illustrated shows such an inspection cover in use on a motor in the new bleachery at Nekoosa. The steel inspection plates normally used on motors of this type were removed and replaced with transparent plates made from $\frac{1}{4}$-inch Plexiglas.

The advantages of transparent inspection plates are quite obvious. They simplify the inspection operation because the inspector can see at a glance the condition of the brushes and commutator. The condition of brushes and commutator can be noticed at all times between inspection periods. Also, because inspection is simplified, there is less chance that an inspector will slip up on checking the motors.—*Nepco Digester*, NEKOOSA-EDWARDS PAPER COMPANY, Port Edwards, Wis.

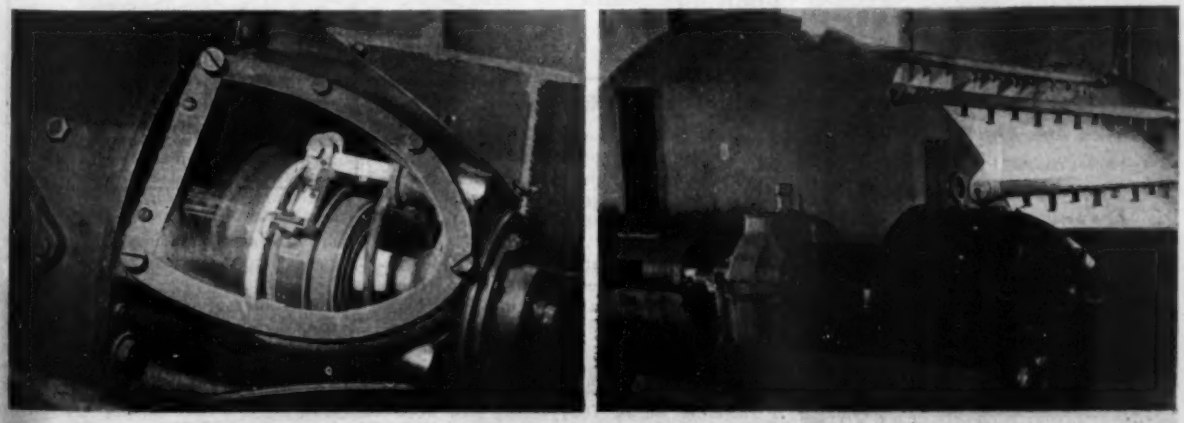
Air Cylinder Maintenance

Double acting air cylinders are normally supplied on all heavy-duty, water-cooled compressors. Double acting cylinders pump air both on the forward and backward stroke through valves on both ends of the air cylinder. Elimination of side thrusts from the piston by use of a crosshead is primarily responsible for the heavy duty classification on double acting air cylinders.

Double acting air cylinders are normally subject to long life and a minimum of wear. However, after extended service, the piston rings, pistons, piston rods and cylinder walls may become worn and require repair or replacement. Air cylinder wear can be greatly accelerated by dirty air or improper lubrication. Lubrication is generally provided by a force-feed lubricator that delivers a constant but adjustable quantity of oil to the air cylinder. Improper adjustment, failure to keep the lubricator filled, or a mechanical difficulty in the lubricator may be instrumental in causing excessive air cylinder wear or in extreme cases, cause cylinder scoring. Lubrication of the air cylinder may be adversely affected by improper cooling resulting from an inadequate quantity of cooling water or dirt and other foreign material in the cooling water passages. Heat generated in the air by running with broken valves may also adversely affect lubrication.

Preventative maintenance is the most effective way of obtaining long trouble-free service from an air cylinder. High quality air filters should be provided and serviced regularly. The sight-feed of the lubricator should be checked regularly and a good grade of air cylinder oil should be used and kept scrupulously clean. Air cylinder valves should be inspected on a regular program so cracked or worn valves can be replaced before they break and seriously affect cylinder performance. A regular cleanout and inspection of the water passages of the air cylinders should be scheduled depending on the speed with which foreign material is deposited. Piston rod packing should be carefully adjusted so that the packing gland advances uniformly to prevent gouging or scoring of the piston rod.

After considerable service, it may be necessary to renew certain parts in the air cylinder assembly. In many cases the piston and



Steel inspection plates have been replaced with Plexiglas on motors at New Bleach Plant of Nekoosa-Edwards Paper Co., Nekoosa, Wis.

WORKS WHERE OTHERS WON'T

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GRAPHALLOY OILLESS BEARINGS

SPECIFY GRAPHALLOY WITH CONFIDENCE

SELF-LUBRICATING ● EXTREMELY DURABLE ● CONSTANT CO-EFFICIENT OF FRICTION ● OPERATES DRY — OR SUBMERGED IN WATER, GASOLINE OR CORROSIVE LIQUIDS ● APPLICABLE OVER A WIDE TEMPERATURE RANGE — even where oil solidifies or carbonizes ● EXCELLENT AS A CURRENT-CARRYING BEARING.

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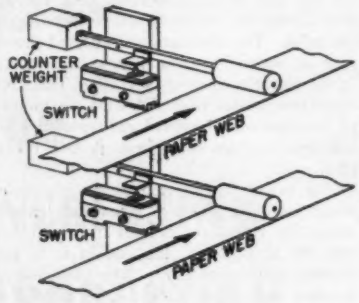
cylinder will be found to be in reasonably good condition and all that is required to renew the efficiency is to replace the piston rings. If the piston is worn excessively this part should be replaced. In case the cylinder is worn, a new cylinder liner should be installed. This can be readily accomplished in the field with the slip-fit liners provided in double acting cylinders by this company for the past 10 or 15 years. This represents a considerable advantage over the older type cylinder which had to be rebored or sent back to the factory for a new liner.

Many users find it advantageous to keep a moderate stock of items such as piston rod packing, lubricator pump assembly, lubricator check valve and piston rings on hand. Such stocks enable maintenance personnel to make changes immediately rather than continuing to run with defective parts, causing possible further damage to the compressor. —JOY MANUFACTURING COMPANY (*Service Bulletin* No. 12, January, 1949).

▼

How To Detect Paper Breaks

Here is a fine idea that has been applied successfully to a paper converting machine. A roller on the end of an extended arm rides on the paper web. A break in the sheet allows the arm to drop, actuating the snap-action switch which is wired in series with the stop circuit, stopping the machine before



any damage is done. The weight of the arm and roller on the paper web cannot exceed a few ounces, so counterweights are applied as shown in the illustration.—HARVEY R. SORGEL, Maintenance Electrician, Milwaukee Lace Paper Co., Milwaukee, Wis. (From *Micro Tips*, published by Micro Switch, Freeport, Ill.)

▼

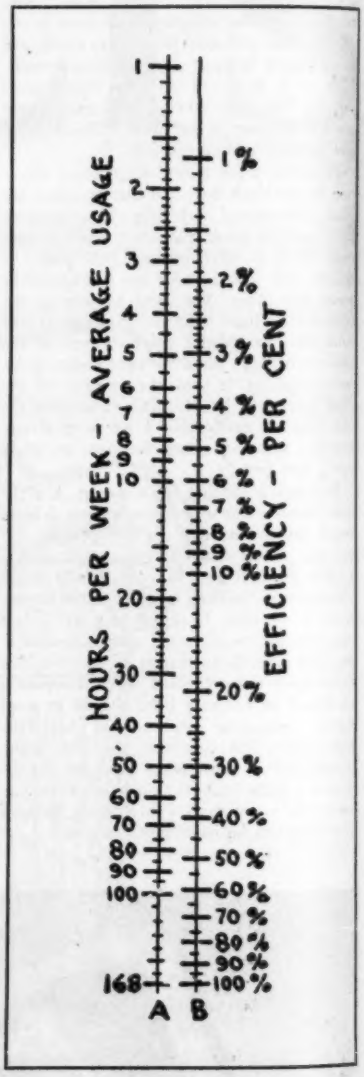
Your Business—How To Appraise Its Efficiency

Many business men consider themselves exceptionally efficient because they "utilize every minute," as they say. But do they? This writer knows very few businesses that are truly 100 per cent efficient in the following sense.

Across the street are three huge buildings which cost millions of dollars to build. The office hours are from 9 A.M. to 5 P.M. No work on Saturdays, Sundays, or holidays. A half hour for lunch. That means 7½ hours are utilized per day, or, 37½ hours per week. There are 168 hours in each week. Therefore, during 130½ hours each week these huge and expensive buildings are idle. The efficiency of the buildings is 37½ divided by 168, or, 0.223, which means that the efficiency is only 22.3 per cent. Not very efficient, is it?

Now, what is the efficiency of YOUR business? The accompanying chart will figure it for you in a jiffy. Find the number of hours of usage per week in column A and glance across to column B. Thus if you operate 40 hours per week the efficiency of your business is 24 per cent, as given in column B.

To make full use of your business property you must use it all the time. The average home is much more efficiently employed



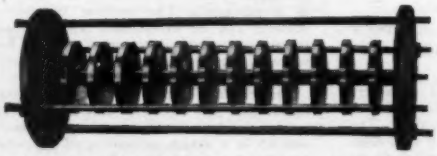
than is the average business property. The average church has an efficiency of less than 10 per cent.

This matter of efficiency is well worth bearing in mind before making that next important purchase. Can you get along without a new building, a new office, a new machine, or a new what not, by making your present business more efficient? Maybe you can. This chart will help you figure it out.

—W. F. SCHAPHORST, M. E.

WANTED!

MORE TOUGH JOBS for Chemalloy



These Test Discs Solve Special Corrosion Problems. If studies of your alloy requirements do not supply sufficient information on which to base alloy recommendations, these test discs are put to work in your plant. Exposed to actual service conditions under which your castings will be used—they determine the correct alloy for your job.

Cast stainless steel hydraulic turbine runners have to be right. The intricate shapes and thin metal sections make the job a tough one. What's more, surfaces must be clean—and the casting free from inclusions—to save machining time and costs. Add these to the corrosive elements encountered and you'll see why Chemalloy was chosen for these two jobs.

Chemalloy castings are uniformly clean . . . machine fast and easy with a good surface because quality is consistent—inside and out.

Where does Chemalloy get this uniformity? 1. Research, experience and skill in dealing with high alloy castings. 2. The combination of the correct corrosion resistant alloy and proper foundry technique. 3. Metallurgical control in each step of production. 4. X-ray inspection to doubly insure quality all the way through.

These runners are typical of the work being done by Electro-Alloys. They illustrate how Chemalloy is being used for the most intricate corrosion resistant castings.

Do you have a "tough" job? One that calls for corrosion resistance? Let one of our engineers explain how Chemalloy can help you. Write to Electro-Alloys Division, 2021 Taylor Street, Elyria, Ohio.

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TAPPI PROGRAM . . . With Abstracts of Papers

▶▶▶ THE BUSINESS MEETINGS of TAPPI comprised fifteen sessions with seventy-one papers read or presented by title. Listed here are the sessions with papers presented at each. A brief abstract follows each paper (except those presented by title).

Statistics

T. A. Pascoe, Nekoosa Edwards Paper Co. (Port Edwards, Wis.), chairman. Five papers were presented at this section:

Testing and the Statistician, by J. B. Catlin, Kimberly-Clark Corp., Neenah, Wis.

This paper discusses the use of statistical methods for improving measurements made by technical control men in the paper industry. While it teaches no statistics and avoids statistical language, it does attempt to give paper technologists a better insight into the statistical portions of their measurement problems. It provides some inkling into the statisticians approach to the solution of these problems, and also attempts to arouse the interest of technical men in the industry so they will make more serious efforts to incorporate modern statistics in their operations.

The subjects discussed are: (1) precision and accuracy, (2) scales and significant figures, (3) new tests and improving present ones, (4) significance of measurement, (5) indirect measurement, (6) attributes, and (7) judgment measurement.

The paper concludes that statistical methods make a very important contribution to the paper industry and will someday take their place beside the methods of chemistry, physics and the engineering sciences which are now used in technical control.

Statistical Control of Paper Quality. I. Basis Weight and Moisture Content, by Charles M. Koon and W. F. Pease, Munising Paper Co., Munising, Mich.

In a sulphite bond and specialty mill, modest but encouraging progress has been made toward the statistical control of basis weight and moisture content. Over a period of three months' operation on one machine, Shewhart control charts have been applied with some success to all runs which were 15 hours or more in duration.

Three advantages in the use of the control charts have immediately become evident: first, the charts have illustrated clearly the effect of basis weight fluctuation on uniformity of moisture content—a relationship which the operators had taken for granted, but which the supervisory personnel had not fully appreciated. Second, the charts have helped to emphasize the undesirable effects of equipment deficiencies whose influence had been known perhaps qualitatively but not quantitatively. Third, on most paper machines, the skill and judgment of the operators are the final factors which determine how uniform the basis weight and moisture will be. The control charts contribute to this skill, because they replace the operator's intuition, and the arbitrary tolerances which are so often established, with practical, realistic limits based upon past performance of the same machine. These limits can eliminate most of the guesswork from basis weight and moisture control.

Mathematical Treatment and Mistreatment of Experimental Data, by T. K. Sherwood and H. S. Mickley, Mass. Inst. of Technology, Cambridge, Mass.

Raw experimental data are generally of little value. The data must be analyzed and co-ordinated before the information can be intelligently utilized. This paper discusses methods for the treatment of experimental data in order to: (a) present the result so that the effect of separate variables may be evident; (b) present the results in a form suitable for subsequent calculation; (c) compare the data with existing theory, or to develop a new theory; and (d) obtain a purely empirical relation between the experimental variables.

In addition, some of the pitfalls that can trap the unwary investigator are disclosed. Examples are used to illustrate the subject matter.

Detection and Control of Tester Error, by J. G. Strieby, Kimberly-Clark Corp., Neenah, Wis.

Tester error may involve either accuracy or precision or both. Detection and control of these two kinds of error and demonstration that the control system operates effectively is the chief problem facing most supervisors of routine testing and inspection systems. Statistical conceps and methods lead readily to quite simple, systematic means for assisting in the solution of the problem. Check testing systems using control chart techniques, sometimes the conventional ones and sometimes modified ones, have been found useful. This paper covers the details of three examples of such check testing systems that are currently in use in connection with variables testing procedures.

Commercial Variance in Schopper Folding Tests, by H. S. Spencer, Howard Smith Paper Mills, Ltd., Beauharnois, Que.

The object of making these tests at eight different laboratories was to allow each to check its instruments with others of the same type. The paper was selected by a skilled chemist, well versed in testing procedure. All doubtful sheets were discarded.

Eight groups of samples from Howard Smith Paper Mills, Beauharnois, were divided into lots of twenty-five sheets each; these were sent to eight different companies, or laboratories, who had agreed to making the tests at 50% relative humidity and 70 Fahr., according to TAPPI standard method T-423 m-45. This method calls for folding endurance to be reported as the average of "at least ten specimens cut from each principal direction." All of the laboratories exceeded considerably the minimum of ten tests.

The comments are made for the layman and not the skilled tester of paper. They are nontechnical and we hope will be of use to purchasing agents and users of paper as well as operators who have standards to meet. These groups have a right to know the accuracy within which a Schopper fold test can be expected to operate under the most ideal conditions.

The summary shows that this paper tested at different laboratories gave widely varying results. Similarly, tests from each laboratory show variations over a wide range.

Wet Strength

K. W. Britt, Scott Paper Co., Chester, Pa., chairman. Three papers were presented at this section:

Wet Strength Paper Problems, by Borje Steenberg, Swedish Forest Products Laboratory, Stockholm, Sweden.

A review is given of the physical chemistry of melamine and urea formaldehyde resins as used for wet strength paper production. The need of further research with respect to urea resin seems urgent, because of the low retention figure of this resin.

Mention is made of the choice of different types of these resins when using different fiber furnish. The conventional way of expressing wet strength as per cent of the dry strength does not properly characterize the unique properties of the wet strength paper. Dry paper is a strong but relatively brittle material. Wetted wet strength paper is a soft and tough material. The mechanical properties of materials so differently behaving cannot be compared by tensile strength data alone. The theoretical interpretation of wet strength mechanism is discussed in the light of stress strain experiment which show that wet vegetable parchment and wet strength paper are very similar in behavior. Some experiments on the properties of wet cellophane and on strips of a fairly high molecular bacteria cellulose sheet are used for comparison with wet strength papers.

Further studies on the degradation of the wet strength effect by hydrolysis of the resin are required as well as of means of overcoming sizing effects when such are not desired.

Some Fundamental Aspects of Bonding Between Fibers, by Herman Mark, Polytechnic Institute of Brooklyn.

The bonding between fibers is of importance for the mechanical behavior of textiles, felts, leather, and paper. There seems to be several types of bonds which contribute to the total effect. The weakest bond is that by merely mechanical action of rugged surfaces; it is responsible for the surface friction of fibers against each other which is used in the construction of yarns and fabrics. Next comes the attraction of polar groups with or without the action of an intermediate layer of polarized liquid. The strongest links which seem to play a role in fiber to fiber bonding are hydrogen bridges, which can develop between strong dipoles on one hand and hydrogen containing groups on the other.

Factors in the Strength of Paper, by Wilfred Gallay, E. B. Eddy Co., Hull, P. Q.

The structure and physical properties of pulp fibers are discussed with special reference to a comparison of cellulose with a general range of long-chain polymers showing a close integration in this general field. The probability of preexistence of fibrils and other fine structures in the fiber is examined, and an alternative interpretation of these bodies is offered.

The meaning of limited swelling in linear macromolecules in general, and in cellulose fibers in particular, is discussed, and the importance of the degree of swelling of a pulp fiber is emphasized. True absorption is sharply differentiated from general inhibition, kinetically and thermo-cynamically.

The possible effects of varying degrees of colloidal swelling on the beating process and on the strength of paper is discussed. The general relationships between colloidal structure of the fiber and mechanism of bonding between fibers are examined. Requirements in suitable extraneous bonding materials or adhesives for pulp fibers are discussed, from the colloid point of view, with typical examples.

Papermaking

James J. Harrison, Michigan Carton Co., Battle Creek, Mich., chairman. Five papers were presented at this section.

The Kenwood Wheel as an Operating Tool, by Irving H. Peters, F. C. Huyck & Sons, Albany, N. Y.

A running papermakers' felt on a board machine will change in length by an amount proportional to the magnitude of the load to which it is subjected. The amount of these length changes can be determined with the aid of a simple measuring instrument called a Kenwood wheel. Excessive length changes adversely affect felt life.

The change in felt length when measured just before and just after any unit which is applying tension load to the felt (such as a press, for example) is a direct indication of the amount of load being applied. By making a "stretch curve," (a series of measurements before and after each load application point on the machine) it is possible to locate sources of undue strain or excessive load on the felt. These excessive loads can be reduced by doing a number of things which will lessen the number.

The felt stretch curve is the only simple way of actually determining what the various tension loads are on the running machine. On machines having electrically driven helper motors it is essential to know the magnitude of these various tension loads in order to operate drives so that an amount of tension load remains which is just sufficient for proper operation.

Curlated Pulp—A New Approach to Pulp Processing, by H. S. Hill, J. Edwards, and L. R. Beath, Price Brothers & Co., Ltd., Quebec, P. Q.

OKAY—
but what's in it for me?

"So America's the richest country in the world. So what?

"So Americans *produce* more than any people on earth. Okay—but what's in it for me?"

At all times, in all ages, nations have had to answer that question—or go out of business.

The average man—the worker, the farmer, the small businessman—is human enough to ask: "What will it do for *me*—for me and my wife and my kids?"

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Machine Power: Since 1910 we have increased our supply of machine power *4½ times.*

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Income: Since 1910 we have increased our annual income from less than $2400 per household to about $4000 (in dollars of the same purchasing power), yet

Work Hours: Since 1910 we have cut 18 hours from our average work week—equivalent to two present average workdays.

BUT THE BEST IS YET—You're right—things can be even better... and must be better. Right now, everyone admits prices are too high. We still have the threat of boom-and-bust. Our system has faults, yet it has brought more benefits to more people than any other system ever devised.

We can beat the boom and bust cycle. We can have even *better* food, *better* clothing, *better* wages, *better* homes, more leisure, more educational and medical facilities.

We can have all this IF we all continue to *work* together and *share* together... IF we continue to realize that each American's personal standard of living will rise in proportion to how much all Americans produce through better machines, better methods, better teamwork.

And that's about it. What's in it for you depends on what's in it for America.

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I will encourage those things which help us produce more and add to everyone's prosperity—things like greater use of mechanical power, better machines, better distribution and better collective bargaining.

I will boost the good things in our set-up, and help to get rid of the bad.

I will try to learn all I can about why it is that Americans have more of the good things of life.

Please send me your free booklet, "The Miracle of America" which explains clearly and simply, how a still better living can be had for all, if we all work together.

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OCCUPATION_____

A permanent change in the shape of pulp fibers is obtained by causing nodules of high consistency pulp to roll in changing directions between two surfaces which compress the nodules while they roll. The change in shape is towards more bends, kinks, and twists and a more tubular cross section. The manipulation also exerts a powerful deshiving action.

The process causes a change in all pulp properties and, while there are many degrees and variations, the effect in general is towards a softer pulp and thus is somewhat opposite from the effect of beating. Freeness tends to rise. In appearance sheets of the treated pulp take on a more even-textured, matte look. The process effect is in evidence applied at any degree of beating. The process effect resembles that of drying in regard to strength properties but differs for stretch, drying tending to lower stretch, and the process to increase it strongly. The process widens the range of quality obtainable from a given pulp, and also permits entirely new combinations of pulp properties, thus indicating a wide variety of possible application. Among other things, it may permit a higher pulp yield for many conversions.

The Curlator—Its Application to High Yield Newsprint Sulphite, Preliminary Report by Frank P. Silver, Price Brothers & Co., Ltd., Riverbend, P. Q.

The Curlator, a radically new type of pulp processing equipment, is described. An account is given of its first commercial trial which was in a hook-up in a newsprint sulphite system to permit an increase in pulp yield. The Curlator was put on the screen rejects in a closed system, and then the digester yield increased in steps until the amount of rejects reached the full capacity of the Curlator to treat them properly. About 10% increase in yield was obtained with practically all of the digested yield accepted to newsprint. The results were entirely satisfactory from operating and quality standpoints, and the equipment and method were thoroughly proven out during eight months of steady operation. The Curlator treated 30 to 45 tons of screen rejects per day at 1 to 1½ hp/day ton. On the basis of the present trial, materially higher yields are envisioned, with Curlators treating the whole sulphite stock.

Elimination of Suction Roll Noise, by John P. Nash, Kimberly-Clark Corp., Neenah, Wis.

The combined efforts of the Kimberly-Clark Corp. and the Beloit Iron Works have resulted in a workable silencer for suction rolls. This silencer, invented in 1937 by E. J. Abbott and J. D. Kraus, provides an air gap on the leaving edge of the suction box so that air must enter the evacuated holes of the shell slowly, the pressure wave which causes the noise in unsilenced rolls being thereby eliminated. It was long thought that this silencer was impractical for continuous mill operation, but further investigation has revealed that it can be installed successfully in the suction rolls of creped wadding machines. Installations have been made with excellent success on eight Kimberly-Clark creped wadding machines, loudness reductions of more than 80% being obtained on some rolls, and it is believed that similar results can be achieved on paper machines.

Fast Cementing of Leather Belting Laps on Paper Mill Machinery, by Samuel L. Allen, J. E. Rhoads & Sons, Philadelphia, Pa.

This paper describes a method and the necessary equipment for accelerating the drying of waterproof nitrocellulose cement with infrared light in the lap of a leather belt when it is installed or shortened. It also summarizes the tests on which the method is based. Studies were carried out on a semiplant scale and showed that a minimum press board time of 10 minutes can be used and that the drying time should be approximately 30 minutes per ply of leather.

The laboratory work involved studying the strength and speed of drying of various cements and such other factors as effect of viscosity, degree of nitration, per cent solids, various plasticisers, and formulation of solvents on the most promising cements. It also correlates the quality and strength of a lap with the press board application time and the drying time with and without the use of infrared light.

Water (Biochemical Oxygen Demand Session)

Miss Louise E. McGrath, Booth Chemical Co., Elizabeth, N. J., chairman. Six papers were presented at this section.

Adaptation of the B.O.D. Test to Pulp and Paper Mill Wastes, by Harry W. Gehm, National Council for Stream Improvement, New York, N. Y.

Uses, advantages, and shortcomings of the B.O.D. test are discussed in relation to its use in respect to pulp and paper mill effluents. Recommendations regarding modifications and application to specific pollution problems is made and results of oxidation rate tests made on several pulp and paper mill wastes by this method reported and compared to the established rate for sanitary sewage. The rate of oxygen consumption by aerobic decomposition of various types of fiber is compared and data concerning the effect of fiber on long time B.O.D. rates are presented.

Some Recent Developments in Evaluating the Biochemical Oxygen Demand in Streams, by F. W. Kittrell, Tennessee Valley Authority, Knoxville, Tenn.

Biochemical oxygen demand (B.O.D.) and dissolved oxygen (D.O.) determinations reveal the condition of polluted streams and are useful in predicting results of reduced waste discharge. An idealized example of the method of using these tools is presented. Practical difficulties met in application to stream examination and evaluation, due to numerous variables in natural streams, and suggestions for minimizing them, are described. These difficulties, imperfect understanding of the fundamentals involved, and a tendency to apply generally accepted concepts indiscriminantly to all types of streams, have combined to discredit the method. Recent developments, which provide explanations for past unsatisfactory experiences and give promise of more acceptable results in the future, are described. Pending further development, it is suggested that empirical rather than theoretical methods of interpreting B.O.D. and D.O. data may be utilized.

Technique of the Biochemical Oxygen Demand Determination, by D. Paul Rogers, Pennsylvania Department of Health, Harrisburg, Pa.

The antistream pollution program in Pennsylvania has created a very active interest in the determination of the biochemical oxygen demand among industries and municipalities because it is the most important measure of pollution from sewages and industrial wastes entering streams.

Some chemists still report the highest B.O.D. value obtained among the various concentrations; some record the lowest; some give the values of all the concentrations; and some take the average value of the concentrations.

This chaotic condition of reporting results makes evident the need for a uniform procedure so that comparable results may be obtained not only in the laboratory but also among different laboratories.

The determination of the biochemical oxygen demand with its arbitrary factors is understood here to be the amount of dissolved oxygen required by the mixed population of organisms in a sample incubated for 5 days at a temperature of 20 C., and expressed in terms of a 50% oxygen depletion.

The test under normal conditions must proceed without any interruption due to the presence of strong acids, caustic alkalies, salts that affect the dissolved oxygen content, salts that inhibit or hamper the liberty of the organisms, and bacteriocidal substances in excessive amounts. If these interferences are present, certain things must be done to eliminate their effects.

In the technique of the determination, suggestions for choosing concentrations, making of dilutions, determining the dissolved oxygen before and after incubation, a simplified calculation of the final B.O.D. in terms of a 50 per cent oxygen depletion are set forth in detail together with tables and examples.

Re-Seeding B.O.D. Bottles—A Means of Detecting Toxic Interference in the B.O.D. Test, by George C. Borden, Jr. and Irene Woodcock, Riegel Paper Corp., Milford, N. J.

Paper mill effluents may contain substances which are inhibitory or toxic in their effect on bacterial organisms. Such biologic organisms in the progress of their normal metabolism establish the foundation for the biochemical oxygen demand test. A substance which through inhibitory influence distorts the rate of metabolism also distorts the B.O.D. determination deriving from that metabolism.

By the means now available it is not always possible for B.O.D. analysts in paper laboratories to be positive in their detection of toxic interference.

Re-seeding is a method designed to provide the average analyst with a technique for the detection of interference with normal metabolism.

Two schedules of re-seeding were experimented with; one introduced the new seed in progressive quantity throughout the incubation period; the other introduced new seed twice during the first 48 hours of incubation.

Stream Pollution from Virginia Pulp Mills, by A. H. Paessler, Virginia State Water Control Board and L. L. Hedgepeth, Calco Chemical Div., American Cyanamid Co., Bound Brook, N. J.

The State Water Control Law is discussed briefly with a statement of its purpose and an explanation of the provisions it makes for controlling pollution. The status of municipal and industrial pollution is presented by means of maps showing the number of persons discharging treated and untreated sewage into each river basin, as well as the number and type of each industry discharging wastes.

The pulp mill pollution problem is discussed. Use of the biochemical oxygen demand test is shown as one of a number of useful tools in determining the extent of this problem. It is stressed that factors other than B.O.D. are of equal or greater importance.

The method of accomplishing pollution abatement does not usually concern regulatory agencies, but it is a matter of much concern to the mills. An example of the regulatory agency's conception of a typical pulp mill pollution problem is shown.

Aeration of Rivers, by L. Warrick, State Sanitary Engineer, Madison, Wis., (Presented by Title).

Structural Fibrous Materials

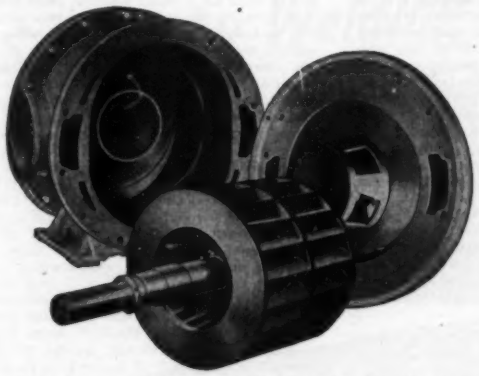
John F. Campbell, The Flintkote Co., Meridian, Miss., chairman. Seven papers were presented at this session.

An Engineering Approach to the Mechanical Testing of Fiber Boards, by Wayne C. Lewis, Forest Products Laboratory, Madison, Wis.

Testing methods for fiberboards are of importance for quality control during manufacture for procurement standards, for rational design of housing and similar structures, and for comparison of the properties of fiberboards with the similar properties of other materials that may be used competitively with them. Test methods heretofore have been developed for quality-control purposes and for procurement specifications, but little or no emphasis has been placed on obtaining test methods that will adequately evaluate a fiberboard for use in a housing structure or that will enable a reasonable comparison between a fiberboard and some other material that may be used in a similar way in a house.

Test method for evaluating fiberboard may be divided into those of small specimens and those of panels or constructions incorporation fiberboard in the way they are used in service. Tests desirable for the smaller specimens are divided further into two groups, those that are used to determine the mechanical strength properties and

SIMPLICITY



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those that are used to determine other physical properties. This paper discusses methods of test with particular emphasis on tests of mechanical properties. Some tests that may be necessary for a complete evaluation of a fiberboard are not completely developed. Possibilities for these tests, as well as those that are fairly well established, are discussed. The experience at the U. S. Forest Products Laboratory on test methods for panels and other constructions incorporating fiberboards is summarized.

Quality Control Method for Insulating Board Pulp, by Henry Z. Mohrer, Federal Paper Board Co. Inc., Bogota, N. J., J. H. Conover, U. S. Gypsum Co., Chicago, Ill., and O. W. Frost, Wood Fibre Products Co., Forest Grove, Ore.

The need for a rapid test for insulation board pulp quality was the reason for the investigation. By using radiant heat in the initial drying stage in addition to hot circulating air, a handsheet, 6 inches in diameter and weighing 14 to 17 grams is dried in 10 to 12 minutes. With this short drying period, a method of test is developed whereby the handsheet can be prepared, dried, and tested within 30 minutes.

The burst test on the handsheet is found to give the best correlation between it and the strength properties of the finished board. In order to provide a basis for comparing the inherent strength values of various pulp types, it was found necessary to develop mathematical relationship which indicates the strength characteristics of the pulp itself. An emperical formula is developed which results in a "pulp quality factor." This factor is a measure of pulp quality.

A correlation between the pulp quality factor values and the strength properties of the finished board makes possible the prediction of the type of board that will be made from the pulp tested.

Comparison of Several Freeness Testers on Board Stock—Williams Freeness Values, by C. E. Hrubesky, Forest Products Laboratory (by title).

In co-operation with the Raw Materials Testing Subcommittee of the TAPPI Structural Fibrous Materials Committee, Williams freeness tests were made at the U. S. Forest Products Laboratory on 15 structural board stocks to compare with values previously obtained with five different freeness testers. Although no exact correlation was found to exist between the freeness values obtained with the Williams and the other testers, the spread in values for different stocks obtained by using a relatively high consistency is approximately of the same order as values obtained with the Schopper-Riegler oversize tester, which showed a greater spread than the other testers used.

Fire Retardment Coatings, by N. Altman, Albi Mfg. Co., Hartford, Conn.

Public concern over fire hazard in buildings, and the ever-mounting loss of life and property through fire have prompted a broad program of building-code revision directed toward the elimination of flammable construction materials.

The development of fire-resistive surface treatments in general is outlined briefly, and the accepted theories of how flame-retardant chemicals function are discussed. Every type of coating considered to have any measure of effectiveness is described, compared, and its individual characteristics noted.

Detailed consideration is given to Albi-"R," the most effective coating now available, and to the principles involved in its superior performance under fire. Mention is made of its impressive test and field record, and of present efforts to adapt the Albi principle for production coatings applicable by plant processing methods.

Evaluation of Fibrous Agricultural Residues for Structural Building Board Products, II. Manufacture of High Grade Products from Wheat Straw, by E. C. Lathrop and T. R. Naffziger, Northern Regional Research Laboratory, Peoria, Ill.

A fundamental study of the relationship between the fiber properties of wheat straw and the physical characteristics of insulation boards made from them has led directly to the conclusion that wheat straw is highly suitable for the manufacture of meritorious products. Methods are described for cooking and refining wheat straw to produce mainly long fibers and also hydrated short fibers. A means of fractionating long straw fibers into various fiber lengths is described. An analysis of the physical properties of insulating boards made from hydrated, filler, and selected long straw fiber has shown that long fibers favor the production of boards of flexural and tensile strengths higher at any comparable densities than wood fiber boards. The impact strength of such boards is two to three times that of wood boards. Tensile strength of such wheat straw boards is directly related to hydrated fiber content, while impact strength is directly related to fiber length, although fiber diameter may also play an important role in impact strength.

Evaluation of Fibrous Agricultural Residues for Structural Building Board Products, III. Manufacture of High Grade Products from Wheat Straw, by E. C. Lathrop and T. R. Naffziger, Northern Regional Research Laboratory, Peoria, Ill.

The details of a process for the manufacture of high quality, very rugged insulating building board from wheat straw are presented. Two kinds of pulp are required: (1) unhydrated long fibered pulp, and (2) hydrated pulp equivalent to that used in strawboard manufacture. Two methods are described for the preparation of these: by pressure cooking or by a new very rapid method of atmospheric cooking and disk refining. The effect of operating variables on physical properties, such as straw varieties, cooking and refining, per cent hydrated fiber and per cent long fiber into pulp blends, per cent moisture of board into dryer, have been carefully studied. Based on previous fundamental work it is possible to arrange this information in the form of an accurate operating range of pulp blends as related to properties of finished product. Due to the springy straw fibers the board may be dried at 50-55% moisture content with large savings in drying costs. Dense boards may be made by drying in the hydraulic press. Process equipment and economics are discussed.

An Electronic Water Penetration Tester, by P. E. Marenholtz, Johns-Manville, Manville, N. J.

The current practice of making water penetration tests by means of the dry indicator method has been found to be unsatisfactory both from the standpoint of accuracy and convenience. More accurate test methods have been developed, but a simpler and faster method is needed.

The Electronic Water Penetration Tester was developed in an effort to answer these needs. It provides an automatic means of registering the time required for water to penetrate a specified depth into the board. The electrical conductivity of the penetrating water is utilized to close an electric circuit. A needle acting as an electrode is inserted into one face of the sample to such a depth that its point is a specified distance from the opposite face which is exposed to water. The instrument is provided with a runing time meter which is started at the beginning of the test. At the instant the penetrating water reaches the needle point, the running time meter stops and a signal light in the instrument is turned on to indicate that the test is complete. This instrument and method offer the advantage of being entirely automatic after the test is started. The final meter reading may be taken at any time after the test is complete.

A series of tests on several different brands of insulation board were conducted. Water temperature was varied from 100 to 130 Fahr. during the tests.

Containers (Symposium on Adhesives)

W. B. Lincoln, Jr., Inland Container Corp., Indianapolis, Ind., Chairman. Four papers were presented at this section.

Studies in Water Resistant Pastes, by Edward H. Hill and Valentine X. Sliwinski, Corn Products Refining Co., New York, N. Y.

The need for a water resistant paste is shown, and some of the work done on this subject by the industry is brought out. However, this seemed insufficient, so special cooks to determine the correct temperature, cooking time, kind of materials needed. *p*H during the cooking, and of the finished pastes, etc., are investigated. So that the value of different pastes can be determined, tests for measuring these are discussed.

From the data assembled in this study, definite conclusions are drawn. Maximum water resistance is obtained by cooking the U.F. resin, starch and/or dextrine together with 5.0% sodium chloride and 1.0% hydrogenated fat, based on starch weight, to a temperature of 195 Fahr. for 15 minutes. Data are given to show that if the salt and the fat are used together a paste will be made that will have a long pot life. One of these alone will not be completely satisfactory. The data did not show any great advantage from cooking the U.F. resin, starch or dextrine with an acid salt, so the *p*H will be below 5.0 at the end of the cooking period. The tack of the paste can be improved by substituting dextrine for part of the thin boiling or thick boiling starch. When this is done, however, the water resistance of the paste decreases in proportion to the amount of starch replaced by the dextrine.

Packaging Adhesion, by Frank G. Morehouse, National Biscuit Co. Laboratory, New York, N. Y.

The author calls attention to the fact that although many users of paper and paperboard are pasting these products together with adhesives to form packages of many different kinds, the existing book of standard TAPPI methods contains no standard procedures for the proper evaluation and description of these adhesive products. The difficulties resulting from this lack of standard laboratory methods are described and it is suggested that TAPPI inaugurate committee activity in this field to examine methods proposed as standards and to develop new ones wherever needed.

The Practical Aspects of Adhesives Testing, by Kenyon Loomis, Adhesive Manufacturers Assoc. of America (Presented by Title).

Silicate Adhesives, by R. L. Kreyling, Philadelphia Quartz Co., Philadelphia, Pa.

The historical growth of the paperboard and corrugated industries has made many demands upon adhesives. The resulting silicate developments are traced and explained, and analyses and properties of the important silicate adhesives are reviewed. Advantages are also indicated for clay and other mixes.

Plant control is stressed, covering both operations and quality. Minimum control methods are suggested, and "pass the buck" attitudes are censored. New, co-operative approach to operating problems is urged.

Water (Water Coagulation)

Miss L. E. McGrath, Booth Chemical Co., Elizabeth N. J., chairman. Six papers were presented at this section.

Modern Color Removal Methods, by J. M. Kahn and E. G. Kominek, Infilco, Inc., Chicago, Ill.

It seems indicated that within the next few years there will be an increased demand for higher quality and whiter papers. Considerable advancement has been made in the use of bleaching agents to produce whiter papers but it also must be remembered that large volumes of water are used in the processing and the quality of water will have an important bearing on the brightness of the finished product.

As the paper pulp is very porous and as it is kept in intimate contact with the water for prolonged periods, the pulp readily acquires any color present in the water. This coloring matter is quite objectionable when high brightnesses are to be attained and therefore the entire subject of color removal is of importance. The

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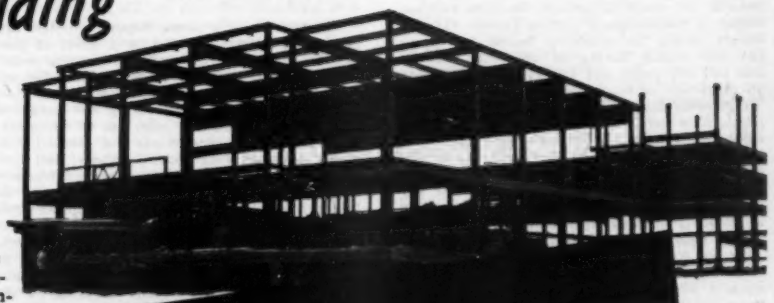

Designers of the new Archbishop Stepinac High School, White Plains, N. Y., specified 12 continuous girder supports for the auditorium and gym roof, ten of them over 80 feet long. In fabricating the steel for the school, Ingalls chose to weld the girders, primarily to save weight. Several other important benefits resulted, besides the saving of 22 tons of steel: The simpler design allowed extreme economy in fabrication. Time was saved, as a smaller variety of parts was required in welding. And the finished girders, which were left exposed, presented an exceptionally smooth appearance.

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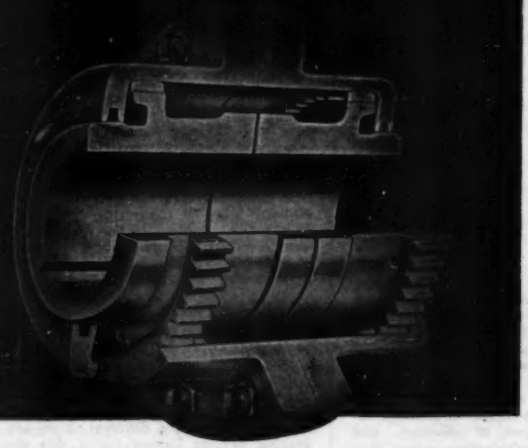

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chemicals required and their effectivenesses for color reduction is closely related to the alkalinity of the water and because of wide variations in raw water alkalinities, the color removal subject is best discussed in three phases: (1) raw waters having an alkalinity below 100 ppm; (2) raw waters having an alkalinity between 100 and 200 ppm; and (3) raw waters having an alkalinity in excess of 200 ppm.

Operating data will be presented to show the relationship between chemical requirements and color removal. While formerly filters played a rather important part in the entire picture of color removal the increased efficiency of pretreatment apparatus materially lessens the importance of filtration. Because of this increase in efficiency in many cases filters may be omitted which result in a substantial saving in plant costs as well as operating expenses.

The report contains operating data of approximately 50 Accelator color removal installations treating waters of various characteristics.

White Water Clarification Coagulants Used in the Flotation Process of the Savalla Save-all, by B. Niberger, Castle & Overton Co., New York, N. Y., and R. E. Bodette, St. Regis Paper Co., Deferiet, N. Y.

The flotation principle brought about in the vacuum tank of the Savalla Save-all is based on the theory of paper sizing developed by R. Lorenz with the exception that air is injected in the incoming white water. Because of the vacuum of about 8 inches working on the aerated water, comparatively small amounts of chemicals are needed to obtain proper flotation. The fiber blanket formed in the tank flows, undisturbed by any mechanical device, over a dam, whence it is drawn off by a combination 3-hp vacuum-stock pump, which is the only moving part on the whole apparatus. The clarified water runs off by gravity.

The following coagulants have been and can be used in the process: aluminum sulphate, sodium aluminate, caustic soda, rosin size, animal glue, calcium oxide, Turkey red oil, pitch, and synthetic resins. When choosing the type of coagulant to be used in the process the chemicals already used around the mill must be given preference. By doing so introduction of additional chemicals can be avoided.

The high efficiency in recovering suspended solids from the white water and the possibility of selecting the most suitable coagulants result also in a high degree of B.O.D. reduction. Five-day B.O.D. tests by independent laboratories have shown reductions of well over 90%.

The recovered stock is of fairly light consistency, usually ranging from about 40 pounds per 1000 gallons up to around 100 pounds per 1000 gallons depending on the amount of solids contained in the incoming white water. This stock is taken back direct to the fan pump on the machine without causing any trouble, and it only takes 10 minutes to return it to the paper machine. This same method has been in use for about three years in Europe but is now applied in the United States for the first time.

The unit is not overly sensitive to normal *p*H changes in the white water and permits normal variations in consistency and volume without need for resetting the chemical dosage.

Flocculation for Flotation as Employed in the Sveen-Pedersen Save-all, by Paul Easton and R. A. Baum, Bulkley, Dunton Co., New York, N. Y.

A brief description and history of the Sveen Pedersen Flotation save-all and the flow principles employed is presented. The development of the Sveen glue as a flocculent and its adaption to the principles of flotation are covered.

The mechanism of collection and flocculation of fiber and filler by Sveen glue and aluminations are covered, as well as recent improvements in the basic glue formula and modifications to suit specific operating conditions.

A second major flocculation employed in the Sveen Pedersen Flotation save-alls is activated Silicasols. The mechanics and principles involved in the use of this recent development are presented.

Other flocculents that have been tried but have not been generally accepted are covered in brief.

Stream Improvement—Settling Waste Materials from Pulp and Paper Mill Waste Waters and Handling Bulk Solids, by A. S. Erspamer and William D. Rice, P. H. Glatfelter Co., Spring Grove, Pa.

The solution of a waste disposal problem can be most efficiently attained by a series of progressive steps. Since the most effective and usually the least expensive methods of waste disposal are preventive measures, efforts were first concentrated on means of reducing the usage of fresh water and making more use of white water. Surveys were carried out and detailed flow sheets made showing source, volume, and type of water used. A program was set up whereby education of operating personnel, reporting of lapses in proper mill operation, improvements in plant operation, and elimination of leaks and unnecessary wastes considerably reduced the volume and quantity of the pollutional load. In a two year period a 20% reduction in the volume of waste, and an appreciable lowering of the solids load were realized. In spite of all mill improvements, and reduction of pollutional load by "inside treatment," there remains a large volume (ca 6.5 million gallons per day) of waste which requires "outside treatment." In order that a method may be devised to make such treatment most effective and within the economic range, a pilot plant was constructed and put into operation. The pilot plant tests were carried out on the stabilized mill wastes to obtain information on sedimentation (with and without mechanical flocculation) which could be applied to a process for treating the wastes. Plain settling effected a reduction of 60% in turbidity, 85% in suspended solids, and up to 98% in settleable solids. The optimum settling time was found to be 2 hours and mechanical flocculation had but a slight effect. The studies also included investigations on sludge disposal covering both lagooning and filtration on an experimental 1 by 1 foot rotary vacuum filter.

Water Treatment for Corrosion and Scale Prevention, by V. J. Calise, Liquid Conditioning Corp., Linden, N. J.

In this article there are presented the practical measures which can be taken by plant managers and engineers in dealing with the problem of corrosion of piping, fittings, and metal surfaces in contact with water. For process water used in manufacture of paper and similar products it is important to have a clear, noncorrosive supply of water. In cooling water applications, particularly with circulating water supplies, methods of treatment and chemical control of circulating water supplies are listed in order to prevent corrosion and excessive scaling of heat exchangers with limitations for each.

Naturally Filtered Water Through Induced Filtration from Surface Water Bodies, by Leland Glidden, Ranney Water Collector Corp., Columbus, Ohio.

This paper deals with the process of abstraction of naturally filtered water through induced infiltration from surface water bodies, such as, rivers and lakes. Water thus obtained is relieved of all suspended load, bacteria, and other microorganisms and requires no coagulation or filtration.

Where great capacities of water are needed, raw water is obtained directly from surface water bodies which is subjected to sedimentation, coagulation, and filtration. This method entails a substantial financial burden as it requires a heavy cash outlay and additional expenditures yearly for operation and maintenance. The introduction of the Ranney system of water supply makes possible the extensive use of induced infiltration to a high degree of efficiency, and huge volumes of good wholesome water have been and are being obtained economically.

The paper further describes how this result can be attained through the intermediary of a Ranney Collector which is substantially a vertical shaft, scaled at the bottom, with horizontal screen projected radically at the bottom of a water-bearing formation. Where this formation extends up to the ground and is in direct contact with a surface water body, large capacities of clear water are obtainable through induced infiltration.

Graphic Arts

R. H. Simmons, Government Printing Office, Washington, D. C., chairman. Four papers were presented at this section:

A New Printing Ink Drying Tester, by Everett F. Carman, Montclair, N. J.

The conventional method of testing with the finger by rubbing is unsatisfactory. Two experimental machines have been made by others. The National Printing Ink Institute has built a machine for this purpose but has not done enough experimental work to prove its utility. Another machine has been built in Holland for experimental testing. The Gardner Laboratories have two machines for testing paint which have been tried. Another paint drying tester which has been built by the Reichhold Chemical Company has also been tried.

The "Ink Dryograph" has been designed to test twenty-four prints at one time. It automatically makes a test on each print every 30 minutes for twenty-six hours. The machine consists of two drums four inches in diameter and five inches long; each hold twelve printed strips. The strips are one-half inch wide and are clamped lengthwise the drum at each end. A sheet of paper which extends around the entire drum covers the wet prints. The drum makes one revolution every 30 minutes. A weighted stylus which presses against the paper on the drum causing the wet ink to leave a series of parallel lines 3/32 of an inch apart for each test strip until the inks are dry.

An attachment has been added for making rub tests and scratch tests on dry printed sheets.

Experimental results and procedure for the use of the machine will be given.

Paper for Web Offset Printing, by Milton Zucker, Interchemical Corp., New York, N. Y.

It was not much more than a dozen years ago that rotary web letterpress printing was restricted to single color work at low speeds. In that short space of time, the successful development of paper machine coated paper, heat-drying printing inks, and heaters has moved the process into the field of high speed four-color printing.

The advantages of offset for certain types of work early suggested the application of the heat-drying technique to web offset; but the process appeared economically unsound for high speed four-color printing because the best plates available had rather uncertain life, breaking down at from 25,000 to 200,000 impressions depending on the character of the work. Recent commercialization of longer life plates with wear characteristics definitely comparable with letterpress, has now opened the possibilities for the change to four-color, high-speed web offset work. Presses are not a barrier; there are over 160 users of web offset presses. Heat drying inks are available. The principal problem is paper which will be comparable in cost and appearance with the paper machine coated letterpress paper, the advent of which, in combination with heat-setting inks, induced the advance of high grade rotary letterpress.

At competitive speeds, however, accumulation of paper fiber or coating on the press blankets is a major problem, being sufficiently bad in most instances to require wash up after a single 36-inch diameter roll.

Xerography and Xeroprinting, by R. M. Schaffert, Graphic Arts Research Div., Battelle Memorial Institute, Columbus, Ohio. (Paper followed by sound film.)

Xerography is an entirely new process of graphic reproduction and of making pictures. It is fundamentally different from any photographic process known up to this time. It is electrical rather than chemical. It does not involve any chemical reactions and does not require any chemical solutions or washing. It involves no fumes. It is a completely dry process. Xerographic plates can be used over and over again. They are not destroyed or clogged by the action of light and can be stored and handled under full lighting conditions. The process is a direct positive and handled under full lighting conditions. The process is a direct positive process and does not require an intermediate negative. No sensitized paper is required. Prints can

be made on almost any kind of paper and on other materials, such as metal, wood, plastics, ceramics, cloth, etc. The process is very rapid compared to other photo processes. The time from exposure to print can be reduced to a matter of seconds. Only four simple operations are involved from exposure to print.

In xeroprinting, some of the principles of xerography have been incorporated in a new and unique printing process which uses dry powder instead of wet inks, and electrical forces instead of mechanical pressure. Xeroprinting can be done at high speeds with light weight machinery and very low power consumption.

Xerography and xeroprinting are still in the laboratory development stage. These processes are not yet ready for commercial use.

An Introduction to Ink Coverages, by A. C. Zettlemoyer and Clyde G. Eckhart, National Printing Ink Research Institute, Bethlehem, Pa.

The coverage of an ink on a particular paper is the area of paper which can be brought to the desired depth of color or blackness per unit weight of ink. This quantity and the per cent of printed area on the sheet are critical factors in the estimation of ink requirements for any printing job. The coverage obtained with any particular ink is a function of the properties of both the ink and the paper as well as press operation.

In this initial study of technique for measuring ink coverage has been developed. Prints were made with tint block used on a Vandercook No. 4 proof press modified so that the rate of printing is reproducible. A Photovolt Reflection Meter has been used to measure the degree of coverage as the film thickness was varied. Direct weighing was used to determine the film thickness.

Some of the factors involved have been examined in a series of ink and paper combinations as used by a publisher. Wide variations have been found in ink requirements. A systematic study of ink variables has also been started. The effect of pigment loading, viscosity of the vehicle, and composition of the vehicle have been investigated.

Pulping and Related Processes

H. W. Bailkowsky, Pulp Div., Weyerhaeuser Timber Co. (Longview, Wash.), chairman. Six papers were presented at this session:

The Solubility of Sulphur Dioxide in Magnesium Bisulphite Solutions, by F. H. Conrad, Missouri School of Mines and Metallurgy, Rolla, Mo.; and D. B. Price, Kansas State College, Manhattan, Kan.

The Duhring relation was applied to a 3-phase 3-component system for the determination of the solubility of the combined sulphur dioxide. The experimental data at 15 and 25 C. were extrapolated for 5, 35, 50 and 60 C. and single solubility determinations at 35 C. add greatly to the reliability of the work.

Pressure composition curves are presented in terms of combined and total SO_2 for temperatures ranging from 5 C. to 60 C.

Comparison with data of other workers for the unsaturated region where but liquid and gas phases are present, indicate that $p - t - x$ diagrams $[p - ps = K (t - 1.95x)]$, where $p = SO_2$ pressure above solution, $ps = SO_2$ pressure above a saturated solution, $t =$ total SO_2 per 100 g. H_2O, $x =$ g. combined SO_2 as in $MgSO_3$ per 100 g. H_2O will describe the system MgO-SO_2-H_2O for the range of 5 to 60 C. and total pressure to 1 atmosphere.

The Effect of Sodium Peroxide Bleaching on the Components of Spruce Groundwood, by Gary W. Jones, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.

The present investigation has resulted in several general conclusions concerning the effect of sodium peroxide bleaching upon eastern spruce groundwood. These conclusions have particular reference to a typical 2% sodium peroxide bleach (calculated on the basis of the ovendry pulp) at approximately 5% consistency. They are as follows:

As evaluated in terms of current wood analysis procedures, sodium peroxide bleaching does not cause any large-scale chemical changes in the known components of spruce groundwood. During a normal groundwood bleaching operation, the total lignin is responsible for about 40% and the holocellulose for about 60% of the total sodium peroxide consumed. The ether and ethanol extractives are of minor importance with regard to an over-all peroxide consumption balance, since they apparently are accountable for only 1% of the total peroxide consumption. Optical data suggested that the major bleaching effect exerted by sodium peroxide upon spruce groundwood can probably be attributed to its reaction with the lignin. It was found that methylation of isolated native lignin with diazomethane or with absolute methanol in the presence of hydrogen chloride markedly inhibits its reaction with sodium peroxide. Accordingly, it was deduced that sodium peroxide attacks lignin primarily through a portion of the carbonyl groups (and possibly the phenolic hydroxyl groups) in the lignin structure.

Kinetic and analytical studies of the reaction between sodium peroxide and isolated native lignin indicated that lignin is composed of two or more fractions which are essentially the same in elementary composition and methoxyl content but which differ from each other with respect to their intrinsic color and chemical reactivity toward sodium peroxide. It was suggested that the bleaching action of sodium peroxide upon spruce groundwood may be the result of a chemical reaction between this reagent and the more highly colored lignin fractions.

Spray Drying Coefficients for Sulphite Waste Liquor, by L. C. Jenness, and R. M. Stinchfield, University of Maine, Orono, Me., H. H. Fogler, Eastman Kodak Co.,

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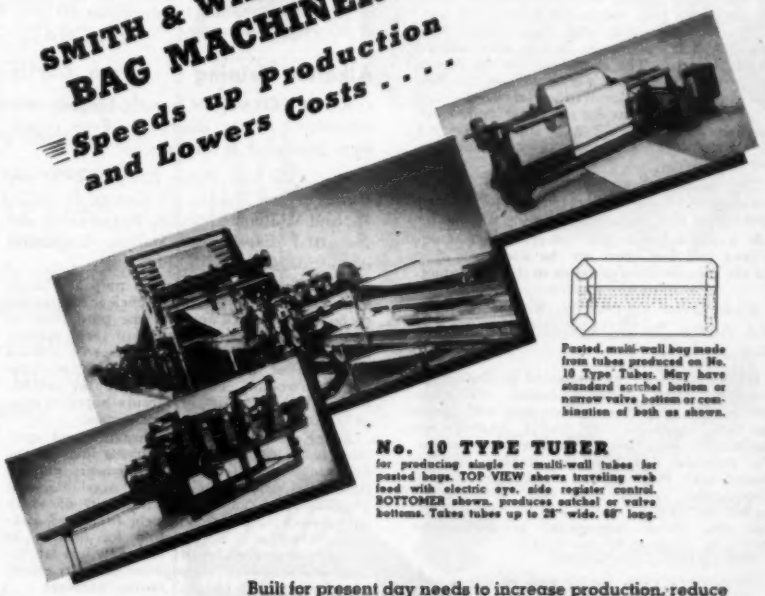

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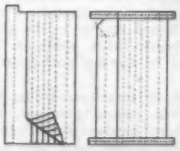

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In the process of obtaining pilot plant quantities of solids from spray dried sulphite waste liquor data were obtained from which a method of computing an over-all heat transfer coefficient, K, is proposed. It is believed that a relationship between the rate of absorption of heat for the vaporization of water, the volume of the spray chamber, and the temperature driving force of the heating medium should be useful for the design of spray drying equipment and for the correlation of data on spray drying. The relationship proposed is $Q/O = KV\Delta tm$, in which Q is the amount of heat utilized by the vaporization of water in the time O. The volume of the spray chamber, V, is in cubic feet and the logarithmic mean temperature difference, Δtm, is in degrees Fahrenheit between the dry bulb and wet bulb temperatures of the heating medium.

Values of the heat transfer coefficient, K, are presented for the spray drying of sulphite waste liquor of 8, 24, and 45% solids in a Bowen laboratory drier, and for 25% solids in a tower dryer. Flue gas was used as a heating medium for both units and the temperature of the entering gas varied from 300 to 600 Fahn. The tower drier was supplied with liquor from pressure type nozzles, and the Bowen drier utilized a rotary nozzle. The coefficients for the Bowen unit were 10.1, 6.8 and 4.6 respectively for feed liquor of solids concentrations of 8, 24, and 45%. The coefficients for the tower unit, when supplied with liquor of 24% solids, were 5.1 for parallel operation and 7.1 for countercurrent operation.

The product from the tower drier was of larger particle size, darker in color, and less hygroscopic than that from the Bowen unit.

It was concluded that the type of atomizer utilized had less effect on the coefficient than did the concentration of solids in the feed liquor.

Commercial Lignins, by Robert S. Aries and Arthur Pollak, Consulting Engineers, New York, N. Y.

Lignin products now marketed in the United States are described and evaluated. The progress in their development from pulp mill wastes has been significant even though relatively insignificant quantities are utilized at present. The technical aspects of the problem are correlated with the cost and application factors. Considerable further work both of a fundamental and applied nature will be necessary before any major commercial accomplishment should be expected in this field.

Experiments on Steam and Water Cooking of Aspen, by J. N. McGovern, K. J. Brown, and W. A. Kraske, Forest Products Laboratory, Madison, Wis.

Aspen *(Populus tremuloides)* chips were subjected to water and steam cooking and over heating before fiberizing the treated chips mechanically at atmospheric pressure to produce pulps in the yield range of 72 to 96%. Variables of time, temperature, ratio of water to wood, and wood moisture were studied. The following results were obtained: (a) water cooking: (1) pulp yield decreased in an orderly way with increasing temperature from 150 to 180 C. and increasing time from 0 to 60 minutes; (2) the rate of pulping as measured by pulp and lignin yields was rapid to a yield near 75% and then was slow; (3) decreasing the ratio of water to wood from 6 to 2 resulted in decreased pulping time for the same yield; (4) air-dry chips cooked faster than moist chips with the same water-wood ratio; (5) maximums in strength properties were shown at yields of 80 to 85% independent of pulping conditions. (b) Steam cooking: the relations of yield to time and temperature of pulping, pulp composition, and pulp strength were closely the same as for water cooking. (c) Oven heating: heating chips at temperatures of 170 to 200 C. in the absence of water degraded the pulps so that their strengths were below those from untreated wood and caused a conversion of carbohydrates into ligninlike material proportional to the severity of the treatment. (d) Corrugating boards: pulp produced in yields of 81 and 84% by water and steam cooking, respectively, were made into corrugating boards that had strength properties equaling or approaching those of commercial hardwood semichemical corrugating board and that corrugated satisfactorily.

Continuous Production of Yeast from Sulphite Waste Liquor on a Laboratory Scale, by A. E. Markham, Hilda D. Agar, and Joseph L. McCarthy, University of Washington, Seattle, Wash. (by title).

Yeast *(Torulopsis utilis)* has been grown in a continuous laboratory scale tower propagator operated at 30 C. under several sets of conditions to process 4 to 14 liters per hour of steam stripped calcium sulphite waste liquor. Measurements have been recorded relative to the operation of the propagator. Samples of the yeast produced were separated by centrifugation, dried, and analyzed. As a result of yeast growth, the content of reducing substances in the sulphite waste liquor was decreased from about 25 to about 10 grams per liter. The yield of yeast amounted to about 35 to 40% by weight of the reducing substances consumed with the latter being calculated as glucose. The dry yeast contained about 8% N and 6.5% ash. The vitamins, riboflavin, nicotine acid and pantothenic acid were found present to the extent of 50, 350, and 70 to 125 micrograms per gram of dry yeast, respectively.

Alkaline Pulping

K. G. Chesley, Crossett Lumber Co. (Crossett, Ark.), chairman. Five papers were presented at this session:

The Pulp and Paper Laboratory of the University of Florida, by George B. Hills, Jr., and William J. Nolan, Engineering and Industrial Experiment Station, University of Florida, Gainesville, Fla.

The position of the Southern pulp and paper industry is noted. A more efficient utilization of Southern forests demands the production of more diversified pulps, which, in turn, necessitates a thorough program of research toward utilization of all Southern forests, particularly the hard woods. The Pulp and Paper Laboratory of the University of Florida hopes to play an important role in this development.

All of the equipment now installed and operating is described. The description includes the following: wood handling equipment; pulping equipment, among which is the wood digestion apparatus, the capacity and flexibility of which is explained; process equipment for board making, including a board mold for making 20 by 26 inch pressed board; the analytical laboratory and constant temperature-humidity room for chemical and physical testing purposes.

Methods of procedure are explained, each step of material processing being traced from the original log to the final pulp sheet or board. The present research program of the laboratory is outlined. Work is planned on chemical and semichemical pulps and disintegrated wood. Pulping research is planned mainly in the alkaline and neutral sulphite fields although the equipment is designed to handle acid pulping processes.

The scrub oaks will be investigated first due to their relation to the tannin problem, followed by other southern hardwoods. Pulping will be done under conditions such that each pulping variable may be studied independently for purposes of fundamental study of the process. In addition, each wood will be pulped under mill conditions for the determination of the suitability of the wood for immediate commercial use. Pulping characteristics of wood wastes are to be determined and equipment suitable for commercial utilization of these wastes are to be investigated.

A plan is presented for training programs whereby operating personnel as well as regularly enrolled graduate students may receive instruction in pulp and paper research concurrent with the research program.

A New Mechano-Chemical Process for Pulping Agricultural Residues, by E. C. Lathrop and S. I. Aronovsky, Northern Regional Research Laboratory, Peoria, Ill.

A new process has been developed for pulping agricultural residues involving combined and simultaneous chemical and mechanical action on the raw material at atmospheric pressure and at temperatures at or near 100 C. Excellent strawboard pulps were produced by cooking wheat straw for 1 hour in a laboratory hydrapulper using the normal amounts of chemicals. Strong, easy-bleaching kraft straw pulps were made in a half-hour cooking period in this equipment. Re-use of the kraft black liquor from the hydrapulper for three successive subsequent cooks had no appreciable effect on the yields or properties of the resulting pulps. The final black liquor contained more than 7% of organic matter. A possible explanation for the rapid pulping action in the hydrapulper is given. The significance of these preliminary results and the advantages of this method of pulping are discussed. This mechano-chemical process might have considerable influence in increasing the use of agricultural residues for paper, board, and their products.

The Hydrolysis of Sodium Sulphide in Mixtures with Sodium Hydroxide, by George E. Martin, Mosinee Paper Mills, Mosinee, Wis.

This work was primarily concerned with the measurement of the degree of hydrolysis of sodium sulphide in solutions with varying amounts of sodium hydroxide, and the application of these data to the interpretation of the role of sodium sulphide in kraft pulping. Attempts to determine the extent of this hydrolysis by conductance measurements, *p*H measurements, and indirectly, by calculation from acidic ionization constants gave only approximate results; these methods had serious limitations as to concentration or temperature, or both.

Satisfactory results were obtained through the application of a method based upon the mol for mol solubility of red mercuric sulphide in unhydrolyzed sodium sulphide and its insolubility in sodium hydrosulphide, sodium hydroxide, hydrogen sulphide, and water. Data on the hydrolysis were collected for the ranges of sodium sulphide and sodium hydroxide concentrations normally encountered in sulphate pulping and at temperatures of 25, 110, and 165 C.

The data revealed that the sodium sulphide concentrations and the temperature of the solution had very little influence upon the degree of hydrolysis. The amount of sodium hydroxide present seemed to be the determining factor.

It was felt that the components of a sulphate black liquor other than sodium hydroxide would have little effect upon the sodium sulphide hydrolysis. With this assumption, the hydrolytic data were applied to analytical data on the sodium hydroxide and total sodium sulphide (hydrolyzed and unhydrolyzed) concentrations in kraft black liquor samples taken at various points during a typical cook. This application indicated that the sodium sulphide was about 40% hydrolyzed at the beginning of a typical kraft cook and about 90% hydrolyzed at the end.

The findings of the work correlate well with the idea that sulphur enters the lignin from the sodium hydrosulphide to form an alkali-soluble thiolignin, and additional theoretical argument is given for the observed benefits of black-liquor impregnation and injection pulping.

Effect of Buffering Agents in Sodium Sulphite Semichemical Pulping, by J. N. McGovern and E. L. Keller, Forest Products Laboratory.

Neutral sulphite semichemical digestions of aspen *(Populus tremuloides)* were made at the Forest Products Laboratory in yields of 74.0 to 75.5% with sodium sulphite pulping liquors buffered to give spent liquor *p*H values in the range of 7.2 to 8.9 with (a) sodium bicarbonate, (b) sodium carbonate, (c) sodium hydroxide, and (d) sodium sulphide. The results of these digestions were compared with those from digestions with an unbuffered sodium sulphite liquor made from technical-grade chemical, giving a spent liquor *p*H value of 6.8. The results were as follows: (1) cooking time decreased with increased alkalinity in cooking; the reduction was approximately one-half in increasing the spent liquor *p*H values from 7.2 to 8.9. (2) Pulp strength was little affected by the kind or degree of buffer except for a tend-

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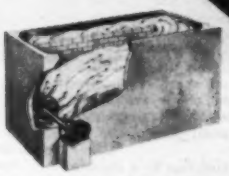

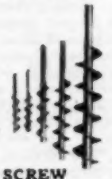

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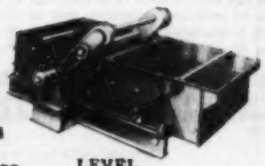

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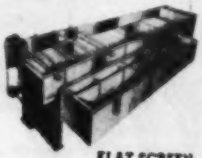

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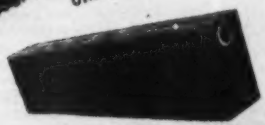

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ency toward slightly higher tearing strengths when sodium hydroxide and sodium sulphide were used. (3) The brightest pulps were obtained with no added buffer or with small amounts of buffering agent giving spent liquor *p*H values of 7.2 to 7.4. A considerably darker pulp was obtained in digestions buffered to a final *p*H value of 8.9 with sodium sulphide. (4) When fairly large amounts of sodium bicarbonate were used, a slightly higher pulp brightness was obtained by not relieving the excess digester pressure.

Deinking Studies III. Survey of a Production System by Screen Analysis, by H. P. Bailey, J. J. Forsythe, and J. F. Tomaszewski, International Paper Co., Niagara Falls, N. Y.

Experiments previously made in a commercial deinking system have indicated that the major part of the defibering and deinking has been obtained during the initial disintegration in an impeller type centrifugal pulper.

Further work conducted on a semi-commercial scale has shown that it is possible to take the partially deinked and defibered stock from the centrifugal pulper and by selective screening with Jonsson screens to separate out the deinked and defibered fractions which can then be run directly to brown stock washers, thereby eliminating the normal cooking procedure or making it necessary on a relatively small part of the total stock.

It has further been indicated that by a combination of selective screening and of disintegration with a small-high speed refiner that the elimination of the cooking process could also be effected.

Brown stock thus produced can be bleached in the regular manner without adversely affecting cleanliness or other properties of the deinked stock.

Plastics

E. C. Jahn, New York State College of Forestry (Syracuse, N. Y.), chairman. Four papers were presented at this section:

Influence of Resin Bonds on the Moisture Stability of Paper-Base Laminates, by M. P. Seidel, Westinghouse Research Laboratories, E. Pittsburgh, Pa.

A series of five phenolic resins was prepared in a 5-gallon kettle. These resins were prepared in an identical way except for the condensation catalyst used in their preparation. These resins were then used to treat kraft paper in a semiautomatic treating machine—the treating specifications of the treated materials were identical. Boards 1/16-inch thick were made from these treated sheets and laminated at three different temperatures. Samples cut from these boards were immersed in water for a period of 90 days and the weight, length, and thickness changes accompanying this immersion were studied.

It was found that there was no dependence of the moisture dimensional stability properties on the laminating temperature for well cured boards. The moisture stability properties of the boards are highly sensitive to the catalyst used in condensing the resin. The viscosity of the resin solution is an important tool in charactering both the speed of cure of the resin and the homogeneity of the treated material.

Specifying Paper Quality for Use in Phenolic Laminates, by H. A. Anderson, Western Electric Co., Hawthorne Works, Chicago, Ill.

The last decade has seen marked advances in the development of methods of testing industrial papers by such groups as TAPPI and ASTM, but little progress in the standardization of requirements. Orders on paper mills call for a multiplicity of types of tests and permissible limits from various customers, all of whom may, for example, be converting the paper to a given grade of NEMA or ASTM phenolic laminate. Since the quantity ordered by each laminator is small in relation to paper mill output and his requirements are specialized, the business is likely to be unattractive to the mill and the laminator finds the requisite quality of paper costly and hard to secure.

In an attempt to improve the situation, an ASTM committee has been organized with a membership composed of interested producers and consumers of absorbent papers. The committee has prepared a specification for paper for use in phenolic laminates, which is in the process of being officially adopted following two years of development. It will cover four thicknesses, each, of (1) rag stock, (2) alpha-cellulose, and (3) high and (4) medium absorbency kraft. It includes requirements on essential cleanliness, limits for stock content, acidity, dry and wet tensile strength, oil absorption rate, dielectric strength, etc., with appropriate test methods in all cases. In developing the specification the committee has had the benefit of copies of prior company purchase specifications furnished by most of the large phenol fiber manufacturers of the country, as well as the advice of laminating and paper mill technical staffs and IPC, NBS, and other research groups.

It is hoped that the precedents established in this work will facilitate the preparation of specifications for other types of industrial papers, which will be of mutual benefit to paper processors and paper producing mills.

Paper Properties Which Contribute to Qualities of Plastics Laminates, by J. C. Pitzer, The Formica Co., Cincinnati, Ohio.

Several properties which can be varied in the manufacture of a saturating paper show a marked influence on the quality of the finished laminate. Among these properties are: furnish, slime or shives, apparent density, formation, and strength. Illustrations are given which indicate that such laminate qualities as heat resistance, blistering tendencies, and punching are affected by one or more of the paper properties indicated. Test data are given to indicate that qualities which can be measured quantitatively such as water absorption, bonding strength, and flexural strength are influenced by paper properties especially under certain conditioning procedures.

Use of Methocel and Other Water Soluble Materials for Thickening Various Latices, by A. T. Maasberg, Dow Chemical Co., Midland, Mich. (Presented by title.)

Preparation of Papermaking Materials

Joseph J. Thomas, S. D. Warren Co. (Cumberland Mills, Me.), chairman. Four papers were presented at this section:

Conversion of Purified Guar Mannogalactan Mucilage for Tub-Size Adhesive, by Arthur J. Haug, Scott Paper Co., Chester, Pa.

A purified fraction of guar mannogalactan was obtained by precipitation from an aqueous dispersion by means of ethanol. This material was characterized by galactose and mannose content, optical rotation, relative viscosity, nitrogen content, etc.

Conversions of this purified mucilage in the presence of borax with sodium hypochlorite were carried out. The oxidations were performed under carefully controlled experimental conditions. Comparison is made with work done by J. Swanson on the conversion of commercial guar mucilage.

Samples of mucilage were converted with 5, 10, 15, and 20% chlorine (based on dry gum) in the presence of borax. The yield decreased as the concentration of chlorine was increased. These products were prepared for and used in laboratory tub sizing operations. A 100% rag sheet was used.

The tub sized paper was tested for bursting strength, M.I.T. fold, porosity, tearing and tensile strengths. Significant strength increases were obtained such as 46% burst and 186% folding endurance. An increase in the amount of oxidant beyond 5% was found to degrade the mucilage substantially.

This work was part of a fundamental study involving the characterization of purified guar and the effect of certain variables including the effect of borax on the oxidation.

The Mechanism of Water Resistance—The Effect of Beating, by William S. Wilson, Monsanto Chemical Co., Everett, Mass.

It has probably been assumed that beating or increased sheet density must of necessity increase the water resistance of a sheet of paper. This is undoubtedly true in the case of waterleaf sheets. However, it is not necessarily true in the case of sized sheets.

No one has ever engine sized a sheet of paper so that it would not give a water penetration test. This proves that there are surfaces in all papers having considerable free energy which can be used to raise water above its original level. On the other hand, all sized sheets contain appreciable amounts of air which it is practically impossible to displace with pure water. This proves that much of the pulp surface in sized sheets is completely hydrophobic. There are thus two completely different types of surfaces involved in any sized sheet.

In two previous papers it was suggested that the equilibrium water pickup, the wet break test, and the water permeability test were scientifically more easily justifiable and practically more informative than many of the tests regarded as standard. The work here reported was to find how these tests were affected by pulp freeness.

It immediately became apparent that the above-mentioned ratio of hydrophylic to hydrophobic surface increased with beating and that probably the increased fibrillation resulted in fibrils too small to furnish the amount of surface, or aluminum bond, necessary to hold the relatively large rosin particle against the turbulence of papermaking.

The data leading up to this conclusion are presented together with the suggestion that perhaps a new test for determining what happens to various pulps on the same beating technique and what different beating techniques do to the same pulp has been developed. There are also possibilities of studying the fundamentals of paper tensile strength.

Mill Trials with Aluminum Chloride as an Alum Substitute, by C. C. Porter, Southland Paper Mills, Lufkin, Tex., and William H. Lane, Monsanto Chemical Co., Texas City, Tex.

No tests larger than laboratory scale nor any commercial usage of aluminum chloride as a size setting agent has heretofore occurred. The reason for this is that aluminum chloride is about three and one-half times as expensive as ordinary papermakers alum at equivalent aluminum oxide contents.

However, aluminum chloride is widely used in the chemical and petroleum industries and is potentially available as a byproduct from many operations in the form of a concentrated aqueous solution. If half of the 1945 usage of 69,000,000 pounds were available to papermakers, it would be equivalent to approximately one-third of the alum demand of the southern kraft industry.

At Monsanto Chemical Company's Texas City plant, an aqueous aluminum chloride solution is available as a by-product, at a concentration of 20 to 30% $AlCl_3$, or 7.6 to 11.4% Al_2O_3. Production is estimated to be 20,000 gallons per month, or enough to supply the demand of the 5-vat, 108-inch cylinder machine at Southland Paper Mills.

Mill trials of 3½- and 5-days duration were made on this machine with the aqueous aluminum chloride as an alum substitute while making a variety of kraft specialties including bleached liners and full unbleached sheets, some of which contained groundwood. No changes in the operation of the machine or differences in the sizing of the sheet occurred. Among the tests run on the sheets were caliper, bursting strength, Penescope penetration with 20% lactic acid, and water absorption. None of these changed appreciably as a result of using aluminum chloride in place of alum. Aluminum chloride consumption was approximately the same as normal alum consumption, based on equal Al_2O_3 contents.

One improvement that was attributed directly to the use of the aluminum chloride was a much better color of the sheet.

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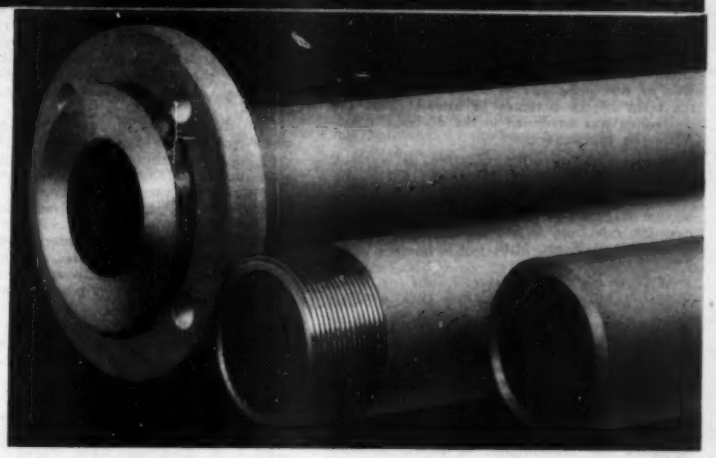

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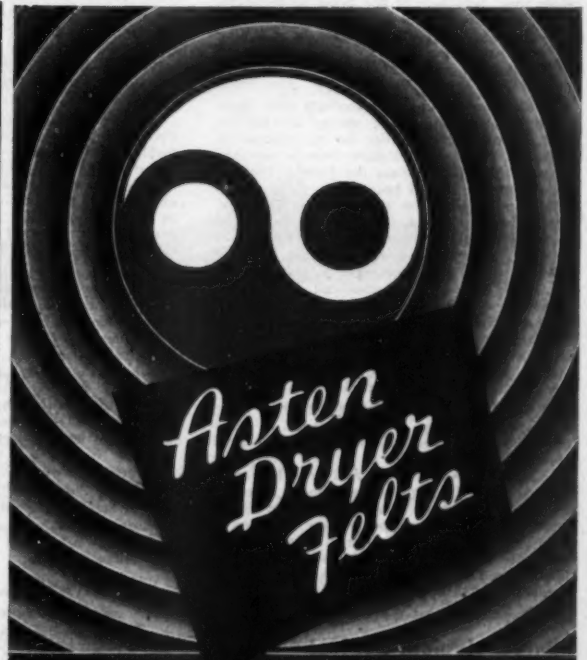

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Another very important improvement resulting from the use of aluminum chloride in place of alum was a marked increase in the efficiency of the melamine resin used for high abrasion resistance and high wet strength. The same abrasion resistance was obtained with 1% of melamine resin in the presence of aluminum chloride as was ordinarily obtained with 2½% of the resin in the presence of alum! This improvement was attributed to the decrease in sulphate ion concentration.

No unusual corrosion occurred as a result of the use of aluminum chloride.

These mill trials have resulted in the sale and regular shipment of concentrated aqueous aluminum chloride from Monsanto's Texas City plant to Southland Paper Mills.

A New Liquid Penetration Test for Measuring the Sizing of Paper, by Donna Price, R. H. Osborn, and J. W. Davis, Hercules Powder Co., Wilmington, Del.

An instrument has been developed for measuring the diffuse reflectance or diffuse transmittance of paper while it is being penetrated by a test liquid. Because wetting by a transparent liquid, e.g., water, oil, or dilute acid, increases the transmittance of paper, measurements of transmittance permit determinations of the rate of penetration and the transudation time for the penetrating liquid. When the penetrating liquid, e.g., ink, is colored, reflectance measurements can be used to obtain the same information.

Rates of penetration and transudation times have been compared with other sizing test values for a number of samples of paper. Data have also been obtained to show the effect of papermaking variables such as basis weight, size concentration, and type of pulp on the rates of penetration by various test liquids.

When the papers being tested have approximately the same thickness and opacity, single-point measurements, e.g., time required for a specified decrease in reflectance or increase in transmittance, can be used to rate papers according to their resistance to the penetration of the test liquids. Single-point measurements are of course more readily obtained than the complete transmittance—time curves which are needed for determining transudation time or penetration rates.

The instrument consists essentially of a light source and an integrating sphere on top of which is mounted a holder for the sample of paper. A beam of radiation from a mercury arc lamp filtered to isolate the 5461 A line or, alternatively, a filtered beam from an incandescent lamp impinges on the sphere wall where it is diffusely reflected. Thus, the underside of the paper sample is illuminated. A barrier-layer photocell, mounted in the sphere, is diaphragmed in such a way that it views only the underside of the sample sheet. This photocell is balanced against a second photocell which views a filtered beam directly from the lamp. This arrangement minimizes the effect of fluctuation in illumination. A measured amount of ink or other penetrant is poured onto the upper surface of the paper sample, and the rate of change of reflectance of the undersurface is measured.

The rate of change of transmittance, as penetration by a transparent liquid proceeds, may be measured by means of a second integrating sphere placed on top of the first in such a manner that light from the lower sphere transmitted through the paper sample is collected by the upper sphere. The upper sphere contains a third barrier-layer photocell, the connections of which are interchanged with those of the lower sphere photocell when rate of change of transmittance is being measured.

Microbiological Control Methods

J. W. Appling, Buckman Laboratories (Memphis, Tenn.), chairman. Six papers were presented at this section:

Bioassay of Slime Control Agents in a Pulp and Paper Mill System, by B. F. Shema, J. B. Anderson, Inst. Paper Chemistry, Appleton, Wis., and J. W. Appling, Buckman Laboratories, Memphis, Tenn. Discussion by G. D. King, Crown Zellerbach Corp.

The use of various chemicals for slime control in the pulp and paper industry has increased tremendously in the past eight years. This demand for an effective toxicant has resulted in the introduction of a number of bacteriocides and fungicides for microbiological control.

The effective sale of any given slime control agent requires its manufacturers to make specific recommendations relating to its use. These may include recommendations for dosage rates, and these may vary, first, because of the actual toxicity of the active ingredients and, second, because of the amount of the active ingredient present in the compounded product. Because of these variances in dosage rates, it is often desirable to determine quantitatively the amount of a particular toxicant at a given point in a mill system.

A method has been developed that is suitable for testing mercurials; by the substitution of the proper organism, it can probably be adapted to the testing of other toxicants.

Further Studies on the Lethal Effect of Dryer Rolls Upon Bacteria, by B. F. Shema and J. B. Anderson, Inst. Paper Chemistry, Appleton, Wis. Discussion by H. C. Fisher, Gardner-Richardson Co. (Presented by title.)

Equipment for Feeding Slime Control Toxicants Into Paper and Pulp Mill Systems, by Charles W. Dean, Buckman Laboratories, Memphis, Tenn. Discussion by F. S. McCall, Union Bag & Paper Corp.

As paper mills have become more aware of the losses caused by slime, the use of chemical toxicants to control these losses has become more widespread. However, the need for careful control of the dosages of these toxicants in order to obtain maximum benefit has not been so well recognized. Nevertheless, it has been demonstrated by numerous mills that maintaining the proper concentration of toxicant for the proper length of time is necessary if a sound slime control program is to be realized. To aid in feeding the desired amount of liquid toxicant into the system, dependable feeding equipment may be installed.

Two basic feeding equipment systems are discussed. In the first a small piston-type positive displacement pump is utilized. To this pump is added a rotameter, either indicating or recording, to give a visual or permanent record of the amount fed. In addition, other equipment such as a cycle controller, proportioning equipment, etc. may be added. This system is satisfactory but its initial cost is high.

A second system utilizes a gear-type positive displacement pump plus a rotameter. These two units cost approximately $100 and provide a reasonable dependable feeding system when used as recommended. The piping arrangement provides for recirculating a portion of the toxicant between the pump and drum. The desired amount is fed into the system through the rotameter by adjusting the bypass valve. Due to the small flow to the system it has been found impossible to use a valve in the main line and get constant feeding due to clogging of the valve by foreign material. The bypass arrangement overcomes this difficulty.

It is believed the utilization of either of these feeding systems, plus a consistently maintained inventory control, will help in attaining economical slime control.

Penicillium Roqueforti Thom, A Mold with High Resistance to Organomercurials, by J. W. Appling, Stanley J. Buckman, and Robert N. Meals, Buckman Laboratories, Memphis, Tenn. Discussion by R. F. DeLong, Marathon Corp.

The only surviving mold in groundwood pulp treated with phenylmercuric acetate was identified as *Penicillium roqueforti* Thom. It is suggested that this mold may be a fairly common one in Scandinavian pulp mills and also that it may be one of the unidentified species of *Penicillium* frequently observed in pulp and slime samples of the United States and Canada. The inhibiting concentration of phenylmercuric acetate in malt agar was about 8 ppm for this mold, a value about four times that obtained for *Aspergillus niger.* For sodium pentachlorophenate in malt agar, the inhibiting concentration was about 40 to 60% less than for *A. niger.* The growth pattern below the inhibiting concentration was normal for the second toxicant but abnormal for phenylmercuric acetate. Chemical analyses of uninoculated controls of groundwood pulp mats with and without added nutrients were compared with those of similar mats which had been subjected during nine weeks to the action of *P. roqueforti.* Changes were of such small magnitude, even in the presence of added nutrients which greatly stimulated growth, that it was concluded they would not measurably affect the usefulness of the pulp.

Evaluation of the Effectiveness of Mold-proof Treatment of Paper and Paperboard, by George A. Cruickshank National Aluminate Corp., Chicago, Ill. Discussion by K. M. Winrich, Cornell Wood Products Co.

In the agar plate method of testing the antimycotic properties of paper the measure of apparent mold resistance depends upon the ratio between the weight of the paper sample and the amount of agar used in the test, upon the *p*H of the agar; upon the resistance of the test organism, and upon the length of the incubation period. Variation of any of these factors can, in certain cases, completely reverse the interpretation of the test.

A sample of 0.001 glassine, *p*H 5.35, containing 0.24% sodium pentachlorophenate failed to inhibit growth of the test organism using 15 ml. of agar in the test. However, when using the same amount of agar with six thicknesses of paper, complete inhibition was obtained. With less than six plies the amount of growth varied according to the number of sheets used. Using a single sheet, a similar gradation of growth was obtained by varying the amount of agar. No growth occurred with 5 ml. of agar, whereas growth was present in increasing abundance in tests employing 10, 15, 20, and 25 ml., respectively.

A sample of 0.003 soap wrap tested using 15 ml. agar over a *p*H range of 5.5 to 8.9 completely inhibited growth of *Aspergillus niger* at *p*H 5.9 and below. Growth of *A. versicolor* was somewhat retarded but still moderately abundant at pH 5.5. Repetition of the experiment using *A. versicolor* on only 5 ml. of agar showed considerably greater inhibition on the acid side than with 15 ml. of agar. Growth at *p*H 5.5 was almost entirely absent. These experiments illustrate not only the effect of *p*H, but also the difference in resistance between two common molds. They further emphasize the importance of the paper-to-agar weight ratio.

Establishing a Nontoxic Germicide, by C. H. Rogers, R. T. Vanderbilt Co., East Norwalk, Conn.

This paper describes the various tests involved in order to establish a chemical germicide as nontoxic. The germicide tested was beta-hydroyethyl pyridinium-2-benzothiazyl sulphide, first evaluated against TAPPI Standard Method T449 m-45 and the U. S. Milk Ordinance and Code.

A discussion of toxicity stresses the fact that with such a subject everything is relative—a completely nontoxic agent having no technical value where one form of life is combatted to safeguard another. Most materials foreign to a living organism are toxic in some degree.

Mill Instrument Control

R. W. Porter, Fritz Publications, Inc. (Chicago, Ill.) chairman. Three papers were presented before this section:

Principles Governing the Choice Between Electric and Nonelectric Instruments. by David H. Fuller, The Foxboro Co., Foxboro, Mass.

The application of electrical instruments in many instances parallels the application of mechanical instruments. Two criteria for determin-

achievement of results with one type which are impossible with the other.

Over-all economy is determined by obvious factors—first cost, cost of installation, maintenance, service, and repair. Where single-point measurement is concerned and the instrument is located adjacent to point of measurement, mechanical instruments are generally preferred. If the distance between point of measurement and instrument location is great, electrical instruments generally have lower over-all cost unless explosion hazards exist or power is not readily available. If conditions of installation are such that damage is likely to occur to connecting tubing or cable of a temperature instrument, the electrical instrument will make up the difference in initial cost within one or two repair jobs. If a number of different points of measurement may be combined upon one indicator or recorder, the electrical instrument is usually to be preferred over several individual or even combined mechanical instruments.

Less obvious but equally important relative factors are production quality and quantity, instrument down time, flexibility and adaptability to installation conditions.

Electrical instruments afford centralized control with improved production. On continuous processes, decreased down time to service electrical instruments is more important than on batch processes. Flexibility of electrical instruments is important on changing processes. Single purpose instruments may have lower first cost. Mechanical or electronic instruments withstand vibration well but electrical instruments do not.

Instruments and Controls—Factors in Their Selection, by Harold A. Scholl, Brown Instrument Co., Philadelphia, Pa.

Paper mill instrumentation has progressed from the experimental stage to a condition of certainty for most applications. However, standardized procedures cannot be prescribed for the majority of instrument control uses because few processes are identical.

Instrument and control selection can be based on experience gained by mill men and instrument engineers from similar installations, but this serves only as a starting point. Factors paramount to one application may be relatively unimportant or completely absent from another so that previous application experience must be backed up by a thorough engineering study of the problem at hand. Determination of all variables and required results may indicate the need for elaborate cascade control, in one case, or in other cases, a simple inexpensive controller.

Automatic Start-Up of Process with Reset Controllers, by H. R. Bristol, The Bristol Co., Waterbury, Conn.

An analysis of the difficulties involved in starting a process on reset control. A suggested method of pre-shifting the proportional band so that automatic start-up of a process becomes a safe, fast, and simple procedure. This method eliminates the need for continuous operator supervision of the process start-up.

Fundamental Research

Harry F. Lewis, Institute of Paper Chemistry, (Appleton, Wis.), chairman. Five papers were presented to this section.

The Measurement of Water Vapor Permeability at Low Temperatures by Means of the Hydrometric Sweep-Gas Method, by W. A. Wink and Leonard R. Dearth, Inst. Paper Chemistry.

Because of the difficulties in the measurement of water-vapor permeability of vapor-resistant barriers at low temperatures by means of the gravimetric method, new equipment, based on the hygrometric sweep-gas method, has been developed, and is described. The new method has been made possible by the recent development of very small, sensitive, and stable electric hygrometers. The sensitivity of the new method results from a combination of the inherent sensitivity of the hygrometric principle and the ability of the small electric hygrometer accurately to measure small changes in the relative humidity of the air passing over a specimen. The sweep-gas method is of the steady-state class and is free of error at equilibrium arising in sorption effects. The sensitivity of the new method is sufficiently high that the length of time required to complete a test is limited only by the nature of the material, especially as the latter determines the time required for the specimen to attain equilibrium with the relative humidities of the air in contact with its two sides.

The Possible Correlation Between Hemicellulose and the Physical Properties of Bleached Kraft Pulps, by Francis T. Ratliff, Johns-Manville Research Laboratory, Manville, N. J.

Five graded pine kraft pulps (ranging in yield from 43 to 66.4%) were bleached with acidified sodium chlorite, thus giving yields ranging from 41.9% to 50.5% (all yields were determined on the unscreened basis). Physical evaluation and chemical analysis of the bleached pulps showed that, in general, strength properties increased continuously with yield and, also, with the hemicellulose content. Handsheets made from the bleached pulps indicated that the area in optical contact was closely related to other pulp properties. Thus, the area of optical contact appears to be a reasonably direct function of the actual bonded area, and the latter (particularly in the early stages of beating) is correlated with the bursting and tensile strengths of the sheet. Apparently the hemicelluloses manifest their effects upon pulp properties by enabling a high specific surface and bonded area to be developed during beating without much decrease in fiber strength. There appears to be some correlation between the hemicellulose content and the physical properties of the bleached pulps, but these relationships are less regular than are those between pulp yield and physical properties. Analyses show that, even in a very raw cook, an appreciable amount of the alpha-cellulose originally present in the wood is destroyed or degraded, and that potentially important carbohydrate material is lost even under very mild kraft cooking conditions.

Paper Partition Chromatography of Simple Sugars as Applied to Pulp Hydrolyzates and to Other Related Substances, by Louis E.

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TAPPI Program . . . . . .

Wise, John W. Green, and Ruth C. Rittenhouse, Inst. Paper Chemistry, Appleton, Wis.

Paper partition chromatography was applied to the qualitative separation of simple sugars obtained from various polysaccharidic papermaking materials, such as partially hydrolyzed aspen and sprucewood, holocelluloses, soda, kraft, and sulphite pulp, an alpha-cellulose from black spruce, and such beater additives as guar, *Ilex mannane*, and other related substances. The application and limitations of the method are discussed briefly.

The Mechanism of Softening Paper by Glycerin, by William McPherson, Jr., International Paper Co., Glens Falls, N. Y.

The purpose of this study was to learn more about the mechanism of the softening action in paper and thus add to the background of knowledge which can be used in selecting and applying softeners to meet new use requirements and in making more effective use of the softeners now used to meet present demands.

The work reported herein is limited to one softener (glycerin) and to sheets of lightly beaten alpha pulp. The glycerin was applied by immersing handsheets in glycerin-water solutions of varying concentrations, pressing, and air-drying.

Sheets containing up to 53% of glycerin were examined with regard to the following properties: moisture content at relative humidities ranging from 11 to 75%, internal friction, flexibility (flexural rigidity), and tensile strength.

It is concluded that a part of the softening action of glycerin in low density sheets of the type studied is a weakening of the sheet through decreased fiber bonding. The hygroscopic or humectant action of glycerin has been over-emphasized because at low relative humidities glycerin treated sheets contain less moisture than do untreated sheets, and at all relative humidities the treated sheets contain less moisture than would equal amounts of glycerin and untreated fiber taken separately.

A Note on the Coefficients of the Kubelka-Monk Theory of the Scattering and Absorption of Light in Paper and Other Diffusing Media, by J. A. Van den Akker, Institute of Paper Chemistry, Appleton, Wis.

The majority of the optical properties of paper depend for their evaluation on diffuse reflectance which, in turn, is related through the Kubelka-Monk theory to the scattering and absorption coefficients of the paper. The latter have often been employed in studies of the optical properties of paper and other light-scattering media. In the development of their useful theory, Kubelka and Monk have followed the convention of employing distance (x) as the independent variable. In the application of the Kubelka-Monk theory, thickness (X) has not proved to be a convenient quantity; for example, it has usually been found to be expedient to substitute basis weight for X. The awkwardness of X in the theory is illustrated in (1) the apparent change in S and K when density is changed in such manner that the scattering power and absorbing power of a sheet actually does not change, (2) the difficulty of relating formulas, based on weight for X. The awkwardness of X in the difficulty of relating the absorption coefficient of coloring matter in solution with the contribution of such coloring matter to the calculated absorption coefficient of pulp or paper. It is shown that the differential equation on which the Kubelka-Monk theory is based can be replaced with one that is mathematically equivalent, but in which S and K are replaced with, respectively, the specific scattering coefficient (s) and the specific absorption coefficient (k) and in which an infinitestimal increment in distance (dx) is replaced by an infinitestimal increment in weight per unit area (basis weight) (dw). All the relationships of the Kubelka-Monk theory, all tabulations, and all charts remain the same except that W everywhere replaces X_2, s replaces S, k replaces K, and, in particular, sW replaces SX. It is suggested that new compilations of the theory and new issues of charts be modified in accordance with these simple changes. The advantages of the change in point of view are discussed with illustrative cases.

Newsprint Paper in 1948

J. J. ZIMA, STATISTICIAN

Newsprint Service Bureau

▶▶▶ THE OVER-ALL record of the year 1948 indicates that the business boom in the United Stated has not yet petered out. However, as the year drew to an end, there were increasing signs that the long postwar rise in general business activity was leveling off. There had, of course, been somewhat similar indications—not perhaps as numerous as now—at various times since the inception of the boom, which although prematurely hailed as harbingers of a turning point in the business cycle, had been followed by a rise to even greater heights of activity.

For the paper and paperboard industry in North America—exclusive of Mexico—the year 1948 was one of record high production. On the basis of preliminary estimates, the industry last year turned out approximately 28,300,000 tons of paper and board which was an increase of somewhat more than 1,000,000 tons or about 4 per cent above the 1947 total. Of the 1948 continental total, the United States produced nearly 78 per cent—slightly more than its proportion of the 1947 total—while output in Canada represented not quite 21 per cent and Newfoundland accounted for a little more than 1 per cent. In view of this tremendous volume of production, it is not surprising that certain segments of the industry reportedly achieved a balance between supply and demand.

In 1948 the North American newsprint paper industry again exceeded all previous production records with the rate of increase over 1947 very closely approximating that of the paper and paperboard industry as a whole. However, this greater output plus a substantial increase in imports from overseas combined with a decrease in continental exports to other parts of the world was apparently not quite sufficient to fully satisfy demand in the United States.

Estimated Yearly Consumption of Newsprint (1929 to 1948)

Year	Population	Newsprint Paper Used	
		Tons	Per-Capita (pounds)
1929	121,526,000	3,780,000	62.2
1930	123,091,000	3,563,000	57.9
1931	124,113,000	3,245,000	52.3
1932	124,974,000	2,840,000	45.4
1933	125,770,000	2,690,000	42.8
1934	126,626,000	3,058,000	48.3
1935	127,521,000	3,300,000	51.7
1936	128,429,000	3,650,000	56.8
1937	129,257,000	3,830,000	59.3
1938	130,215,000	3,458,000	53.1
1939	131,878,000	3,550,000	54.1
1940	132,817,000	3,730,000	56.2
1941	133,923,000	3,930,000	58.7
1942	134,633,000	3,800,000	56.4
1943	136,497,000	3,650,000	53.5
1944	138,101,000	3,250,000	47.1
1945	139,621,000	3,480,000	49.8
1946	141,229,000	4,296,000	60.8
1947	143,382,000	4,753,000	66.3
1948	146,116,000	5,141,000	70.4

SUPPLY

Production

Despite the loss of some production in certain areas due to power shortages, the all-time record high output of the North American newsprint mills in 1948 amounted to 5,850,000 tons. The previous peak production in 1947 was exceeded by 205,000 tons or nearly 4 per cent, while the increase over 1946 was 573,000 tons or 11 per cent. Also, in comparison with 1937—the best prewar year—we find that 906,000 tons or 18 per cent more newsprint was produced than in the earlier twelve-month period.

United States producers accounting for 14.8 per cent of the continental total in 1948 recorded a slight increase in proportion of total output in comparison with 1947, while the Canadian and Newfoundland mills representing 78.7 per cent and 6.5 per cent respectively showed very small declines from their relative positions in 1947.

Production in Canada in 1948 amounted to 4,601,000 tons and was 154,000 tons or 3½ per cent greater than in the previous record year of 1947. Due largely to coming into operation of new facilities and the probably more or less temporary conversion to newsprint of machines usually producing other grades, the 867,000 ton output of United States manufacturers was 42,000 tons or 5 per cent greater than in 1947 and also

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1500	G.E.	M.T.	6600	253
1000	Al.Ch.	ANY	2300	240
800	Westg.	C.W.	6600/440	597
750	Westg.	C.W.	2300	900
750	G.E.	M.T.-16	2200	450
600	G.E.	I.M.	2300	600
600	G.E.	I.M.	440	353
500	Ideal	A.V.	2200/4000	1200
500	Al.Ch.	ANY	2300	514
400	G.E.	I.M.	2300	900
400	Al.Ch.	ANY	4000	1180
400	Al.Ch.	ANY	4000	514
350	G.E.	I.P.	2300	720
350	Westg.	C.W.	2300	450
300	G.E.	I.M.	2300	600
300	G.E.	I-EA	2300	1750
250	Ideal		440	720
250	Al.Ch.	ANY	2300	300
250	Westg.	C.W.	2300	600
125	G.E.	I.M.	2300	720
100	Al.Ch.	ANY	440	720
100	Westg.	C.W.	440	575
75	G.E.	I.M.	440	1750
75	G.E.	I.M.	440	514
60	Westg.	C.W.	2300	870
50	I.A.	G.H.	440	870
50	G.E.	I.M.	440	1720
35	Westg.	C.W.	440	1200
35	G.E.	I.M.	440	12[illegible]
35	F.Morse		440	1800
30	Linc. crane		440	900
30	G.E.	M.T.	2300	1750
30	G.E.	ITC	440	1800
30	G.E.	M.T.	220	900
25	G.E.	M.T.	440	1200
20	Al.Ch.	ARY	440	900
15	Westg.	C.W.	440	900
15	Al.Ch.	ARY	440	900
11	Westg.	MW	440	1100
10	Al.Ch.	ARY	440	900
7½	G.E.	ITC	440	1200

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500	G.E.	KTP	440	1800
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400	G.E.	I.K.	2300	1800
400	Westg.	C.S.	2300	1800
350	Westg.	C.S.	2300	900
300	G.E.	I.K.	440	900
250	G.E.	I.K.	2300	900
250	Westg.	C.S.	2300	1200
200	Wagner	26V.	440	1200
200	G.E.	K	2300	720
200	G.E.	K.P.	2300	705
200	G.E.	TEFC	2300	1800
200	Westg.	C.S.	440	720
150	G.E.	K.T.	2300	600
150	Cent.	TEFC	440	900
125	Westg.	C.S.	440	3600
125	G.E.	TEFC	440	1200
100	Al.Ch.	A.R.	440	514
100	Al.Ch.	A.R.	440	900
100	U.S.	Vert.	440	1200
100	Burke	E.M.	440	1200
75	Triumph	T.E.	2300	514
75	G.E.	I.K.	440	720
75	G.E.	F.T.	440	720
75	Westg.	Vert.	2300/440	900
75	G.E.	K.	220/440	1200
75	G.E.	TEFC	440	1200
75	Al.Ch.	A.N.	440	1200
75	Al.Ch.	A.R.	2300/440	1800
60	Al.Ch.	A.R.	440	514
60	G.E.	KG-exp.	440	1200
60	G.E.	K.	440	1800
60	G.E.	TEFC	440	1800
60	G.E.	K-444	440	1800
50	Westg.	C.S.	440	900
50	G.E.	KT-346	440	900
50	Westg.	TEFC	440	1200
50	G.E.	K-444	440	1800
50	U.S.	Vert.	440	1800
50	Westg.	C.S.	440	1800
40	G.E.	K.T.	440	720
40	G.E.	K.T.	440	900

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was above that in any year since 1942. The Newfoundland mills which by the end of the first quarter of 1948 had turned out 12,000 tons less newsprint than in the same period of the preceding year, more than overcame this deficit in the balance of the year with the result that their output of 382,000 tons was nearly 9,000 tons greater than in 1947 and surpassed all previous records.

In the endeavor to keep pace with demand, for the second successive year the industry has found it necessary to make the fullest possible utilization of existing productive capacity.

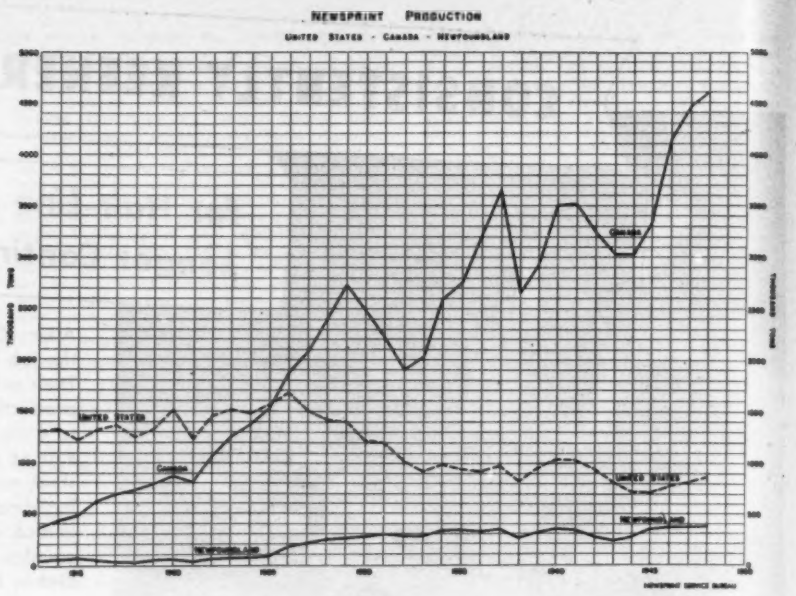
Shipments of newsprint paper from all mills aggregated 5,834,000 tons and were but 16,000 tons less than production. They were, however, 128,000 tons or 2 per cent greater than in 1947 and 576,000 tons more than in 1946. Canadian mills shipped 101,000 tons more in 1948 than in the preceding year, while there was an increase of 34,000 tons in United States shipments and a decrease of 7,000 tons in those made by Newfoundland producers.

As the result of shipments slightly below the level of production, total manufacturers' stocks on December 31, 1948 amounting to 118,000 tons were 16,000 tons or 16 per cent greater than on the same date a year earlier, but on the other hand were 44,000 tons below the quantity they had at the end of 1946. Practically all of the increase was due to a nearly 10,000 ton rise in Canadian stocks and one of 6,000 tons in Newfoundland while United States mills had only a few hundred tons more than at the end of 1947. Stocks of all manufacturers in the aggregate represented about one week's production at last year's rate.

EXPORTS

Canada

Official reports issued by the Dominion Bureau of Statistics indicate that in 1948 exports of newsprint paper from Canada amounted to 4,328,000 tons, a gain of 108,000 tons or 2½ per cent over 1947. The value placed on these exports totaled $383,123,000 which represented 12½ per cent of the total dollar volume of Canadian commodity exports. This was an increase of $40,830,000 or 12 per cent more than in the preceding year. Both in point of tonnage and value thereof, exports in 1948 were the largest on record.



Of the total tonnage exported, 3,917,000 tons or 90½ per cent went to the United States, while the balance of 411,000 tons was shipped to overseas destinations. The 1947 hitherto peak level of exports to the United States was exceeded by 242,000 tons or approximately 6½ per cent, while there was a decline of 134,000 tons or 25 per cent from 1946 in shipments elsewhere.

The largest overseas importers of Canadan newsprint in 1948 were the United Kingdom, Australia, South Africa, Brazil and New Zealand, to which was shipped a total of 197,000 tons compared with 309,000 tons in 1947. The decrease of 112,000 tons from the preceding year was due to a drastic decline of 118,000 tons in exports to Australia because of exchange difficulties and a decrease of 1,000 tons in the quantity shipped to Brazil, while 5,000 tons more went to the United Kingdom and 2,000 tons more to New Zealand. Shipments to South Africa in both years were approximately the same in quantity.

Newfoundland

Newfoundland in 1948 exported 375,000 tons of newsprint or approximately 6,000 tons less than in 1947. However, with the exception of 1947 and 1937, exports were greater than in any other year. Of this total, nearly two-thirds or 247,000 tons was shipped to the United States, while 128,000 tons went to other destinations. Exports to the United States in 1948 were 35,000 tons in excess of the preceding year while there was a decrease of 41,000 tons in overseas shipments which as a result were lower than in any year since 1942.

United States

The Department of Commerce reports that in 1948 nearly 28,000 tons of domestic newsprint were exported from the United States or approximately the same quantity as in both preceding years, but 16,000 tons less than in 1945. About 39 per cent of the total or 11,000 tons went to Mexico, while 7,000 tons went to the Philippines and slightly more than 2,000 tons to India and Pakistan. The only other country to take as much as 1,000 tons was Cuba.

In the aggregate, the North American newsprint industry last year shipped 567,000 tons of paper to help feed hungry newspaper presses in other parts of the world. This

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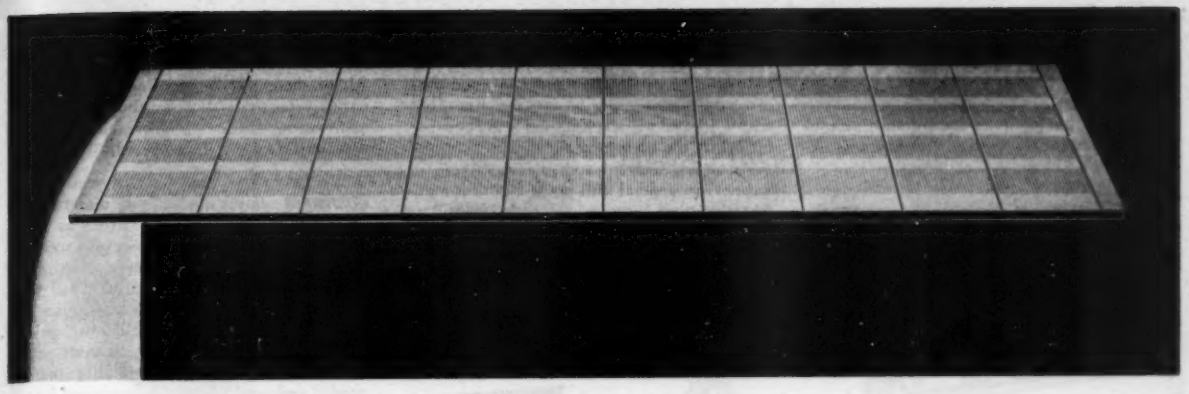

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was approximately 175,000 tons less than in 1947 and far below that of the peak export year of 1940 when more than 900,000 tons were shipped to other markets. As in 1947, governmental import restrictions in certain countries again had a depressing effect on continental exports.

IMPORTS

According to official reports from Washington, imports of newsprint paper into the United States in 1948 amounted to a record high 4,393,000 tons of which nearly 89 per cent came from Canada, 6 per cent from Europe and 5 per cent from Newfoundland. Imports from Canada and Newfoundland were the largest on record while only in 1939 and 1937 were imports from Europe above those of last year.

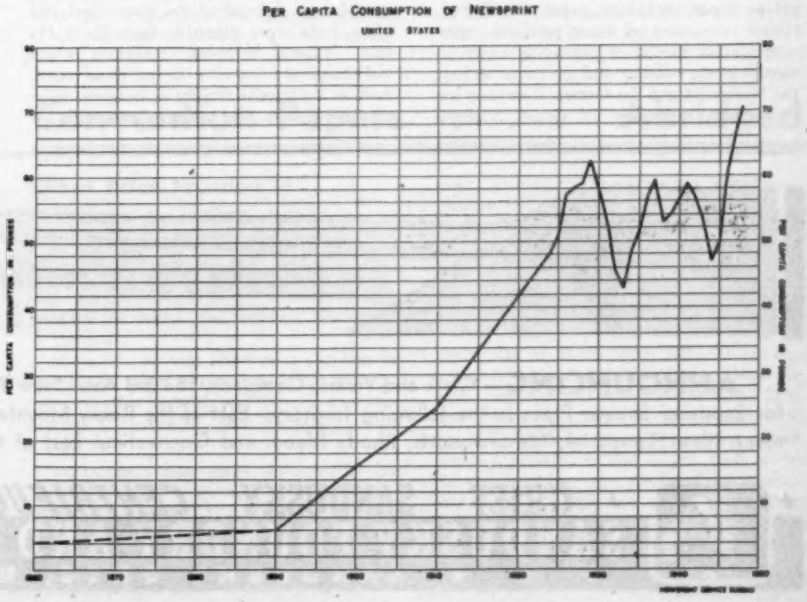
Of the 267,000 tons of newsprint paper which in 1948 came into the United States from Europe, 132,000 tons came from Finland, 70,000 tons from Sweden, 28,000 tons each from France and Norway, with the balance coming from half a dozen other countries. The quantity imported from Finland was 10 per cent above the target figure for exports to this country which Finnish producers had established at the beginning of 1948 and which they hope to improve on in 1949. The increase of 45,000 tons over 1947 in imports from Sweden was unexpectedly large, while tonnage imported from France and Norway also was greater than had been anticipated.

Altogether, imports represented 84 per cent of the total quantity of newsprint available for consumption in the United States in 1948 as against 74 per cent 10 years earlier.

CONSUMPTION

Estimated newsprint paper consumption, Census Bureau figures of population in the United States as of July 1 and the calculated pounds of paper used per capita since 1929 are shown in table on page 1822.

The 1948 per capita figure of nearly 70½ pounds was 4 pounds above that in 1947 and approximately 8 pounds greater than the prewar peak of 1929, while the wartime low of 1944 was exceeded by more than 23 pounds or nearly 50 per cent. It has been estimated that per capita use of all kinds of paper and paperboard in the United States in 1948



amounted to approximately 357 pounds of which about 20 per cent was newsprint.

OUTLOOK

The foregoing has been a discussion of past history but of more immediate interest and concern are the prospects for business in the future.

Currently there appears to be more uncertainty among business men and economists as to the future course of business than there has been at any time in recent years. Most experts reportedly believe that no pronounced descent from the very high levels of the recent past is in prospect while, on the other hand, it is quite generally expected that over-all business activity in 1949 will be not quite as good as in 1948. Although activity in important capital goods industries is still high, there is a good deal of readjustment going on in other lines, but with a looked-for leveling out at a point not far below the boom's peak.

Assuming that no appreciable decline in business in general will develop and the expectation that more widespread intensification of competition in many lines will necessitate a greater reliance on advertising to help move goods, it would appear that a continuation of the present high level of demand for newsprint paper can be expected at least in the immediate future.

Review and Outlook for Unbleached Kraft Paper

DERNELL EVERY, SECRETARY
Kraft Paper Association, Inc.

▶▶▶ IT IS FAIRLY general knowledge by now that the pulp and paper industry in 1948 exceeded all of its past production records. The same held true for the kraft paper manufacturing industry. Annual production of unbleached kraft paper during 1948 amounted to about 2,200,000 tons. This was approximately 10 per cent higher than the production in 1947, the previous high record year.

With United States production of all kinds of industrial goods—perishable and non-durable consumers' goods, capital goods and construction materials—at record levels throughout the year, it did not prove difficult for the kraft paper industry to live up to the record forecasts made for it just a year ago.

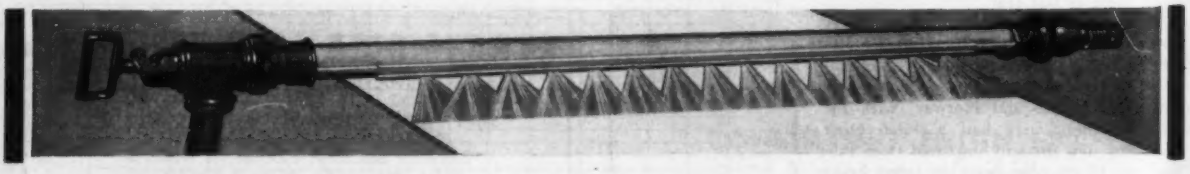
Kraft paper is not a single purpose product. The kraft paper manufacturer produces many distinct products, several of them in substantial volume, each with its own separate group of consumers and converters. We are referring to such products as wrapping paper, bag paper, shipping sack paper, envelope paper, asphalting paper, etc. The ultimate consumers of these products represent a cross section of practically every industry in the country and go on to include the housewife and the farmer. Not only has the recent expansion in Gross National Product given stimulus to the demand for kraft paper, but in addition there has been the factor of growth in population which has contributed 15,000,000 new consumers since 1940. It was only natural that these favorable factors should result in a greater demand for kraft paper than ever before. They provided a substantial backlog of orders throughout most of 1948, giving full leeway to the industry's capacity to produce.

Not only did the kraft paper industry have the incentive during 1948 to produce up to its full capacity, but with the rest of the pulp and paper industry it suffered from few obstacles to heavy production. Among these obstacles might be mentioned the reduced pulpwood receipts in the South in the spring which had resulted from extended rains in that region, and the losses of pulpwood in the Pacific Northwest in June when the worst floods in that region's history swept away some of the wood piles of the kraft paper manufacturers in that region. These losses were entirely made up in the South and largely made up on the Pacific coast before the end of the year. Coal and other fuels were plentiful throughout the year. Adverse shipping conditions which had faced the industry in previous years, such as occasional freight embargoes, shipping strikes, etc., did not arise to trouble the industry. Labor scarcities of former years also seemed to have disappeared and, in fact, the quality of available labor improved. All of these factors gave momentum to the industry's activity and contributed to making 1948 an unusual and auspicious year that may well be long remembered.

We have now entered a new year. There is already a great deal of disagreement among the professional forecasters as to its outlook. The majority, however, seem to anticipate a lower average rate of operation in most lines of business during 1949 with a resulting decline in national income and sympathetic decline in commodity prices. Since we are dealing here with kraft paper, which is a "service" commodity that is needed and used in every industry and household, we must expect any decline in general business to have a direct effect on kraft paper.

Despite the definite correlation between national business activity and the demand for kraft paper, we are not pessimistic about 1949. Even if retail trade has to resort to sales and bargain days to attract its customers, wrapping paper has to be used to wrap the bargains. The use of grocers bags is related more to population than to national income and population will continue to grow in 1949. A high level of construction will be maintained during 1949 with its consequent demand for cement and other rock products. These require shipping sacks. So does the fertilizer which the farmer is using in greater quantities than ever before. His crops are ultimately delivered to the consumer in feed, flour and sugar sacks. Although the paper shipping sack industry has witnessed the return of a seasonal demand for its product, there is no evidence that the total tonnage of shipping sack paper that will be cut up in 1949 will shrink materially from its record tonnage consumed in 1948. The envelope manufacturers want more kraft paper than was available to them last year. Thus, as we check off the probable demand in each of the grades of unbleached kraft paper that is being manufactured, we cannot share the pessimism that is prevalent in business as a whole.

This demand varies between grades depending, of course, upon the particular industry or consumer group which that kind of kraft paper serves. Most kraft paper manufacturers have learned to diversify their



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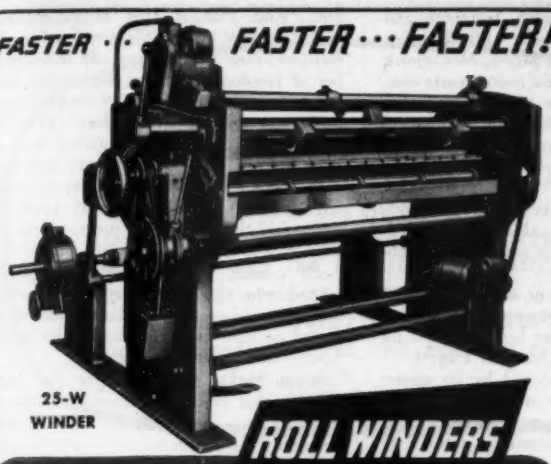

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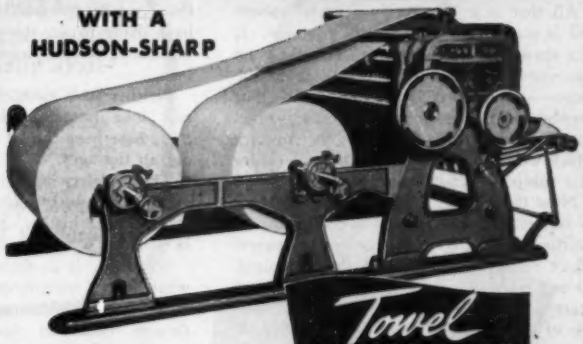

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production so that the seasonal pattern of any single industry cannot distort their own production. The very limited seasonal pattern in the production of kraft paper itself is evidence of this diversification.

The Kraft Paper Association employs Dr. Charles F. Roos and his Econometric Institute to advertise it regularly on general economic conditions and the industry's position with respect to these conditions. Dr. Roos has been engaged in making forecasts for the demand for kraft paper for the past four years. On the basis of probable 1949 National Gross Product and the normal average growth of the kraft paper industry, it is Dr. Roos' belief that the demand for kraft paper this year could amount to as much as 2,400,000 tons. The translation of such demand into orders placed with the mills and production will be tempered by today's deflationary psychology. Consumers and converters will prefer to meet as much of their current requirements as possible out of their inventories with the result that mill production will not fully reflect actual consumption. This condition, Dr. Roos believes, will cause a return of seasonal demands in the industry: periods in which capacity is not adequate to meet orders and others in which surplus production develops.

Practically every part of the economy has taken a breather during the early weeks of the new year. As already mentioned, many consumers of kraft paper have rested on their inventories. This has permitted the kraft paper manufacturers for the first time in years to give attention to developing new customers and products. Specialties are reappearing. Colored and fancy wrapping papers as well as lighter weight kraft papers may again become available. These variations from extended runs of paper of one kind and one basis weight definitely slow down production. In consequence, it is our present thought that this industry's production ratio during 1949 will not exceed that of 1948. In that year the industry operated at 95 per cent of capacity, a most satisfactory rate of operation. Now with slightly increased capacity, an equivalent rate of operation would result in a higher production for 1949. We would estimate this at somewhere between 2,200,000 and 2,250,000 tons. This would result in the establishment of a new record volume for kraft paper production in a year in which other industries expect to suffer a decline. The vitality of the economy, however, should require this amount of kraft paper.

Convention Papers . . . Abridged

What Price Freedom?*

COLA S. PARKER, President
Kimberly-Clark Corporation

Every one of you is engaged day in and day out in a process of development, a process for which the absolute prerequite is freedom.

Some of you may show on a chart as in operations, some in research, others in technical or other control, and some in administration or elsewhere. But essentially, with your training background and experience, there is no one of you who is not concerned basically with the constant day to day effort to improve your operation through improvement of present products or processes or the research into or invention or development of new ones.

Now that is a process which is going on every day in every shop, mill or factory, research or technical laboratory, large or small, all over this whole broad land. It is the process which has made America what she is. With less than 7 per cent of the world's population and 6 per cent of its area we are able to produce and are producing more than one-thid of all the world's goods. There is no need to labor the point by citing our relationship with the rest of the world in telephones, radio sets, miles of railway and hard roads, telegraph, automo-

(*) Abridged from paper presented at the 14th Annual Papermakers Get-Together, sponsored by the Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry and the Michigan Division of The American Pulp and Paper Mill Superintendents Association, Inc., held January 13, 1949, at Kalamazoo, Michigan.

biles, bath tubs, refrigeration, etc., *ad infinitum*. But in view of our direct interest, we shouldn't overlook that we produce and consume more than half of all the paper and board produced in the world today.

All that is in the purely material sphere and is merely cited by way of example. It is a result and not the cause. Tonight I am concerned with and wish to talk about the cause—and what is happening to it. For simply stated, there is but one cause—Freedom—that has really made this the America which we know and love. Hence, my choice of a subject, "What Price Freedom?"

Now to be sure, we often hear reference to our natural resources. What is usually overlooked is that these natural resources aren't really resources until they are used. At any rate, they were here for millions of years until America came along and made use of them. Many there are that we lack, but such lack hasn't stopped our progress to the highest standard of living the world has ever seen. China and Russia are reported to have more than we do. Yet China's emissaries have only recently sought more help and Russia is continuing a cold war in part because she does not let her people know the contrast between their condition and ours. Certainly the continent of Africa surpasses our territory in resources. So resources are merely something with which to work, a material, not a causative agent or a catalyst. Nor is the answer native ingenuity, inventiveness, or natural or acquired skills. We in America have no monopoly on brains, inventive or otherwise, even though we smile at the Soviet claims of first invention of the telephone, telegraph and radio which now are made. Eli Whitney, Alexander Graham Bell, Morse, McCormick and Edison have had their counterparts elsewhere, and we all know the Chinese, more than twenty centuries ago are reported to have made paper, the greatest of civilizing influences, when properly used, known to man.

Neither have we had any corner on effort, toil, long hours, or hard work. Indeed, these have been the lot of mankind throughout all the ages.

The priceless ingredient, the catalyst, that man has sought for all the sixty centuries of his recorded history, has been summed up in just one word—Freedom—or Liberty.

So where it is threatened by no matter what force, regardless of source or with what good intentions or apparently fair though fallacious reasoning, unless we would supinely surrender, it is our inescapable obligation to appraise that danger and to fight it with all our force and not lose our freedom by default.

Mayhap there is a question in your minds as to the validity of that statement. Let us assume, however, that you will agree, at least, that freedom is the priceless ingredient, the catalyst, that has resulted in our America. It seems to me that that proposition doesn't require argument, for all history seems to demonstrate that the advancement of men has only happened where he was free, and each step backward has come when freedom has been curtailed.

But I would point out to you that freedom is an absolute thing—integral and indivisible. And that is true notwithstanding quondam talk about this freedom or that freedom, four freedoms or any other number of freedoms. So that one cannot limit freedom in any true sense without dangerously jeopardizing all freedom. Once we accept a limit here or a limitation there we have set our feet on a pathway which no other people in history have yet succeeded in retracing. Perhaps we may prove the exception, though history furnishes no parallel as a basis for such hope.

Of course, you all recall that somber phrase which was all that Mr. Churchill said he could promise England when he was called to head its government at its darkest hour—blood, sweat, and tears.

I can phrase no phrases for you, but I can say that even such sacrifice as that implied is not too much to demand when freedom is in jeopardy.

Now I shall not attempt, in the short time at my command, an analysis of all the perils to freedom that exist today. But not the least is apathy, the refusal to face facts, the effort to load on government all the burden of individual care, the failure to recognize that while power in private hands is dangerous, unlimited power in the hands of government is inevitably fatal to freedom.

Tonight, and mayhap you are saying it is time I came to my subject, I shall deal with but one facet of this subject—the inherent conflict between freedom and security and the danger to freedom in security at the hands of the State.

Incidentally, I might say that your committee suggested that you would be interested in trends in the paper industry—what the outlook might be, etc. And I thought to myself, why do we wish to peer into the future? Isn't it to see how secure we are going to be, and if it doesn't look too good, maybe we can do something about. Yes, maybe we can fix that.

In other words, there can be no criticism, and I am making none, of the search for security. It was a part of the thinking of the man in the dim past who made the first stone ax by tying a sharp stone to a stick. This invention enhanced his personal security in two ways; first, in securing his food; and second, in gaining an advantage over his enemies who had only a club or a sharp rock, not both in one. So the search for security is an invaluable force—an age-old effort which, if eliminated, would obviously remove probably the second greatest incentive for advancement that man has ever had. The first, of course, is freedom.

Perhaps that very statement, which I am sure you must recognize as true, which seems so completely axiomatic, would also seem to render discussion of my point unnecessary. Certainly if individual men are to be guaranteed complete security from birth to burial by a government capable of making good its guaranty, what more is there to be sought by all but the very, very few?

But there is the catch—"by a government capable of making good its guaranty." Again I must rest my case on history regardless of that cynical estimate that "all that we ever learn from history is that we learn nothing from history."

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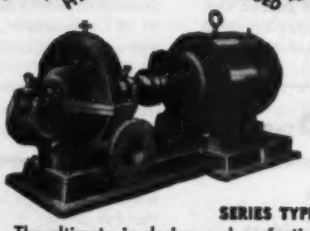

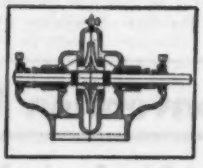

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rants, emperors, kings, aristocracies, etc.—the story is the same. Many have gained power, complete power with the assent of the people, claiming to be benevolent despots—to know better than the people themselves what was best for the people, promising complete security. And what has been the result? Whether it was bread and circuses in Rome, or ever normal granaries in Egypt, always there came a constantly lowering standard of living and ultimately collapse, with the people finding they had surrendered their liberties for the promise of security and even that, except the security of slaves, had disappeared.

Now of course I am not talking about National Security, the security against aggression from without. This is within the province of government, a power delegated to government. That most (i. e., the military establishment, Marshall Plan, Foreign Aid, etc.) accounts for almost half our federal budget today and thoughtful men are warning that there comes a time when spending for that particular security can wreck the civilian economy upon which it is dependent. But that is another story.

However, this constant insistence upon National Security, if that is a proper term, inevitably adds spurs to the thought of our individual security and that of our dependents. How could it be otherwise?

But the very fact that there is a grave question as to how much preparedness (for instance) the economy can stand without snapping, should, but apparently doesn't, lead us all to question the addition of further burdens for individual security.

For unfortunately, even here in the U.S.A. (to which all the world is looking for aid) we find a highly articulate and skillful group of advocates for a way of life completely the opposite of that which has served us (and the world) so well—and still does—and which is the only way of life that offers any hope of ability to provide the help the rest of the world seeks. And these siren voices seeking to sell that other way have but one representation to make—that the individual will be better off under that new way—because the State will take care of him.

Now that is the starting point of the attack on our way of life, bare, bald assertion with no proof, and directly contrary to the verdict of history! As a next step we find it asserted even more frequently that our way of life is on trial. For instance, that it will not survive another depression, and that if one should come, the all powerful State is the sole alternative—whether it be Communism or some other stateism or dictatorship. Do you wonder that I say, "What Price Freedom?"

Why is it that so many accept so blindly the bland assertion by those who seek power and are willing to make any promise to get it, that our way of life is on trial? Do they ever stop to realize that even during the darkest days of our worst depression those at the bottom of the economic scale and those on relief had a higher standard of living, more and better food, clothing, and housing than the average, not the lowest, but the average citizen of any other country in the world?

Part of the reason for the Communist lust for chaos is the unthinking acceptance of the fraudulent representation that our way of life instead of theirs is on trial. Those who advocate more and not less freedom are not seeking chaos. Free enterprise, free markets, however bitter the competition struggle, have not been chaos. Our former *laissez-faire* economy was not chaos, for *laissez-faire* (that much abused term) meant "to be permitted to do or to make." In other words, it was a true description of what existed here for 160 years, during the greatest demonstration of progress the world has ever seen. It was the right of a free American to decide for himself how he was going to live, how he would earn his money, whether he would save it or spend it as he pleased, whether to seek more learning or to work, at what kind of a job and whether to stick to it or go elsewhere, to make his own business, what and how much to plant, how much he would pay for what he wanted to buy, and how much he would take for what he wanted to sell.

All that and more too is what is in danger through apathy, indifference or worse.

Perhaps you may wonder whether I am not "drawing a long bow." For I do not say that these freedoms will be lost this year or next. What I do say is that we are being urged to set our feet upon that path which has never yet been retraced, by the same people, if in fact we haven't already tread quite a distance upon it.

Consider what was promised in the last campaign. I'm not talking partisan politics, but these things were promised: Continued

high prices to farmers; lower food prices to city folks; higher wages to labor; high and more social security to all—all of which spell higher costs to all producers, but to be accompanied by lower living costs to all.

All this was to be financed by higher taxes on business, usually called big business, and higher income taxes on the larger incomes (sometimes called "soaking the rich"). In addition, to make it work (if it didn't otherwise) there was to be a restoration of controls, price controls, allocation (rationing, that is), etc. To be sure these were to be so-called "stand-by" controls, but the mailed fist was there inside the velvet glove.

So far as I was able to ascertain, there was no counter program or denial of what I have recited, so I repeat I am not talking partisan politics.

In connection with such a program it might be of interest to note that just last year the Senate Finance Committee estimated (since I.R.B. current statistics aren't yet available), that there were only 2.4 million people in the U.S.A. with incomes of more than $5,000 each, having aggregate incomes before taxes, of 28 billion dollars. So if all these incomes (every dime of them) were taken by taxes, they would pay less than two-thirds of the present federal budget—much less the increased cost of such a program. And if only the excess over $5,000 were taken it would meet only a little more than one-third of the present budget.

And so you may well ask, as I do, "What is the answer?" It seems to me that it is simple, and that it is so universally overlooked because we misunderstand the premise.

Certainly no one of us will deny that individual liberty is the natural heritage of every individual. That is something with which, as our forebears put it in declaring their independence, we are endowed by our Creator. It isn't man made or State granted—it is something inherent and not conferred. But what is overlooked is what follows. Freedom is inseparable from Responsibility.

Of course we have oft quoted that expression—*Eternal vigilance is the price of liberty.* But vigilance is not enough. Only a recognition, acceptance, and a meeting of our responsibilities will serve. I would like to touch one point in closing. It is something that all of you can do, and it concerns our own individual business. As we all know, if any one thing is being attacked more viciously today than another, it is corporate profits. Now I am not pleading for profits as such, big or little. You all know as well as I do, the necessity for a profit if there is to be any individual security for anyone connected with a business. You all know, too, the functions that profits serve. You know, as well, that it is only the dollar amount of profits that is attacked. Yet they are low historically by any valid measuring stick, per cent to sales, per cent to investment or as a percentage of total national income.

You know that without fair profits we could not have expanded our capacities on all businesses so as to be able to produce all the things that people want and need.

So isn't it just one of our responsibilities to say so, and not at all apologetically. Is it too far fetched to point out that actually individual security consisting first of all of a steady job for those who want it (freedom implies some may not want it) can come only from a prosperous business?

Let me pose this question—if everyone connected with a given business could be made to understand the workings of that business and the system of which it is a part, could as a result come to understand the part he plays, with a sense of partnership in the enterprise upon which his livelihood (and future security) depends, be made to understand that neither labor leaders nor politicians can permanently expand the source of their income, that only they themselves in co-operation with all others in the enterprise can accomplish that and then only by greater production, would we need to worry about government encroachment on the rights of the individual? Wouldn't we be able to resume our progress of the past 160 years, defying whatever political prestidigitators appeared upon the scene? Would we need to ask, "What Price Freedom?"

Finally, isn't it part, indeed just a small part, of the responsibility which our freedom entails that each of us do our part toward such an end?

A few weeks ago, Mr. Webb, director of the budget, in speaking of some of the things I have mentioned here tonight such as government security and its cost, said:

"The decisions we make in the next few months will affect our fiscal policies, our economy and our national affairs for years to come." A pessimist might change those words "a few years" to read "for all time."

I would remind you that when our forefathers were seeking that freedom they have transmitted to us as our precious heritage, they answered that question, "What Price Freedom?" in these words:

"And for the support of this Declaration with a firm reliance on the protection of the Divine Providence, we mutually pledge to each other our lives, our fortunes, and our Sacred Honor."

In the light of that pledge, can our answer be anything less than the full acceptance of our responsibilities?

Chromium Plating in Paper and Pulp Mills*

STERLING O. WARNER
Chromium Corporation of America

Much credit must be given to the paper and pulp industry for its farsighted willingness, as far back as twenty years, to include chromium plating in their scheme of lowering maintenance costs, increasing production, and improving the quality of their products. Today, all of the more progressive mills are using chromium plating wherever it is feasible, and some prominent applications are: Press Rolls, Breaker Rolls, Breast Rolls, Calender Rolls, Coating Rolls, Couch Rolls, Dryer Drums, Embossing and Printing Rolls, Glue Rolls, Pump Plungers, Roll Necks, Size Rolls, Screen Plates, Slice Lips, Smoothing Rolls, Suction Box Covers, Table Rolls, and Wire Return Rolls.

Calender rolls have generally been a source of ever increasing maintenance costs due to frequent grinding. In 80% of the mills where chromium plating has been used on calender rolls, it has been successful in resisting rust, pits, abrasion, and scoring. Further, the elimination of the necessity for constant grindings has more than paid for the cost of chromium plating. A word of caution is injected here in regards to plugged stacks and if this condition is severe and frequent, the chromium will tend to dent but will not break, unless the base chilled iron breaks out.

Coating of paper is rapidly increasing in volume and therefore coating and knurling rolls must be maintained at minimum costs.

(*) Abridged from paper presented at the October 2, 1948, meeting of the Pa.-N.J.-Delaware Division of The American Pulp and Paper Mill Superintendents Association, Inc.

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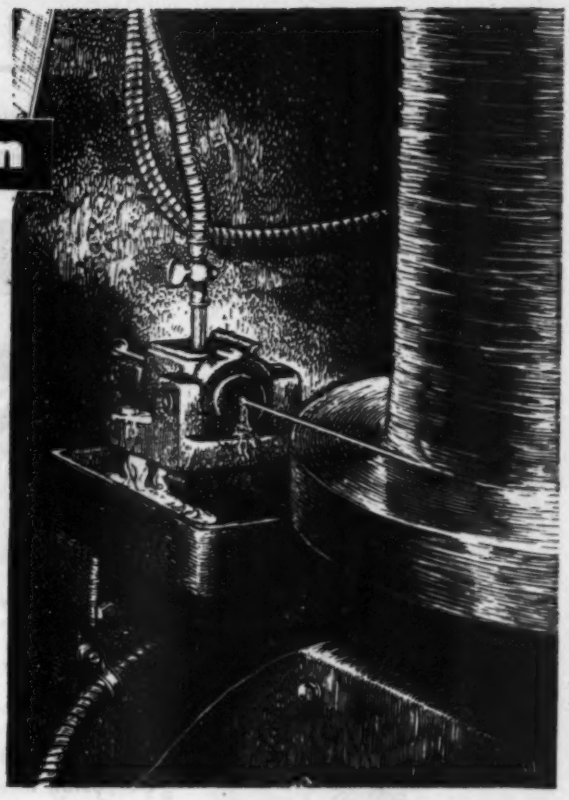

Each step in the specialized production of paper machine wires—including drawing and annealing—is performed by Appleton Wire Works, Inc, . . . another reason why Appleton Wires are Good Wires.

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Special preparation of the coating roll surface prior to chromium plating, and then further technical finishing of the plating insure a surface that is hard, will stay clean, and give the desired amount of coating. Practically all of the users of knurling rolls are now using chromium plating for hardness, nonsticking, and the ability of the chromium to reproduce the knurls perfectly. Rolls with two hundred lines per inch or more are regularly being plated with excellent results.

Dryer drums are a natural test of the qualities of chromium plating and in recent years, many mills have more frequently used this application for varying reasons. Elimination of scoring, rusting, pitting, and frequent grindings are the most conspicuous advantages. It should also be noted that chromium has a high heat transfer efficiency, thus assuring quicker drying and less power consumption. Since it is possible to obtain mirror finishes and other desirable finishes, many mills use this hard and clean surface to impart special lusters and finishes on their paper.

Embossing and printing rolls, of either copper or steel, are one of the oldest and most successful applications of chromium plating. Here again, hardness, cleanliness of surface, and exact reproduction of the design in the roll is obtained and maintained for a long period of production.

Pump plungers, piston rods, rams, and roll necks are perfect examples of the need for a surface that is hard and smooth and will not pit or score. With these qualities present, elimination of frequent packing changes is made possible in the case of the first three mentioned. Unless there is an extreme local corrosive condition, the plating will permit indefinite use of packings and many years of plunger life before removal for replating.

Screen plates are one of the long time performing parts in paper mills and are a tribute to the several advantages of chromium plating. Over 100,000 flat and curved bronze plates with chromium have been installed in paper mills throughout the country in the past twenty years. The outstanding advantage is elimination of slot wear and the need of constant checking. In addition there are: maintained screening capacity, use of finer slots, prevention of corrosion and wear, preservation of slot size, less need for cleaning, reduction of dirt count, and reduced maintenance and replacement costs. The application of a chromium to both flat and curved plates is very desirable. Caution should be exercised where hydrochloric or sulphuric acid is used and advice should be obtained regarding the effect of both the above on chrome plating.

Suction box covers, made of bronze, perforated or slotted, drilled, and generally of ⅝-in stock, have been used with chromium for the past fifteen years. Designed for use with either wire or felt, they are conceded to be the longest wearing covers. A substantial thickness of chromium, plus a radius on all perforations or slots, and on the edges, eliminates sharp edges and possible cutting of the felt or wire. Since the chromium becomes smoother with wear or friction, it is natural that both felt and wire life are increased. Due to the cover being reversible, it is chromium plated on both sides and can be turned over when one side becomes worn. Eventually, the remaining chromium can be stripped and the cover replated. Planings of covers are eliminated. This type of cover is being used in mills with operating speeds up to 1000 fpm. Wire return rolls, generally made of brass, are an excellent application and many of these rolls are salvaged with chromium. Elimination of frequent grindings and new jackets is a direct result of plating. The hardness and smoothness of chromium is prolonged and does not mark the wire or the felt.

The salient points to remember about the electrodeposition of chromium are:

1) It is unaffected by alkalies, organic acids, and most ordinary corrosives except hydrochloric acid

2) Its hardness varies and reaches a maximum of 1050 Brinell

3) Its heat conductivity is good and is in the proximity of gold, silver, and copper. It resists oxidation to 1150 Fahr. and its melting point is 3500 Fahr.

4) It is used in finishes from rough grain to mirror finish and can be made porous or nonporous

5) It can be successfully applied to most base metals when they are properly prepared

6) Its industrial application ranges in size from a small thread guide in the textile field to a 50 ton roll, 50 ft long, in heavy industries

7) It is generally applied in thicknesses up to .030-in

8) It is usually more economical to apply chrome plating on new parts. However, there is a large volume of salvage plating regularly being done and is possible in paper mills

(Turn to page 1836)

New EQUIPMENT *and* SUPPLIES

Low-Cost High-Lift Pallet Worksaver

A new, low-cost, high-life *Worksaver* electric pallet truck is announced by the Yale & Towne Manufacturing Co., Philadelphia Division, 4530 Tacony St., Philadelphia 24, Pa. This new 2,500-lb. capacity pallet truck is battery-operated both for travel and lifting loads; is 39 by 31 inches in over-all dimensions, not including the forks; and lifts pallets 66 in. for overhead tiering.

The mast is 83 in. high and permits the truck readily to enter such low head room spaces as street trucks and freight cars. The

1,965-lb. weight of the truck and battery permits handling loads where larger heavy-duty trucks could not be used—for example, multi-story buildings, having floors of low capacity, in elevators, and over bridges and areaways.

The small over-all dimensions of the motorized pallet truck permit its use in such confined areas as narrow aisles, crowded production zones and in the aforementiontioned elevators and public carriers.

Battery Charge Indicator for Industrial Trucks

To improve industry's habits in using the industrial truck battery and to prevent battery-operation in an overdischarged condition (frequent overdischarging shortens battery life), the Gould Storage Battery Corp., Trenton, N. J., announces a new charge indicator which gives the momentary charge condition of the battery, and thus keeps the operator informed as to its state-of-charge throughout the shift.

The dashboard-mounted instrument is distinguished by two major points: (1) lower cost than similar instruments, and (2) ability to report the state of discharge at any instant.

The indicator is marked off into four sections, each of a different color. Green, indicates a one-half to full charge; yellow, one-quarter to one-half charge; red, zero to one-quarter charge; and pink, indicates the battery is being used in an overdischarged condition. A rugged all-aluminum case, designed specially for vertical mounting, houses the instrument. The gauge is read while the truck is actually in operation.

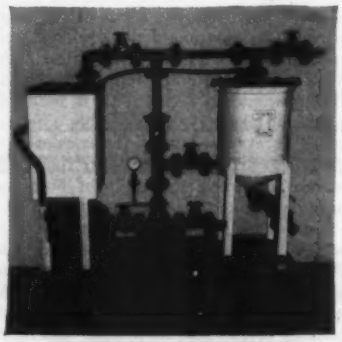
The Wheatstone bridge type of instrument can be used with 3, 6, 12, 15, 16, 18, and 24 cell batteries, a series of resistors and taps being arranged to permit the desired adjustment. A toggle switch disconnects the instrument from the battery during charge.

Corrosion Resistant Filter

A series of filters, constructed of Saran-lined steel pipe and fittings and rubber-lined filter and precoat tank, has been announced by Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N. J.

Designated as series SLA, the filters can be used in industries where corrosive liquids are filtered. The filter parts combine a high degree of corrosion resistance with the supporting strength of steel backing.

The SLA filters can be used at temperatures between 0 Fahr. and 180 Fahr. for general service. Both the Saran-lining and the rubber-lining have excellent insulating properties and, therefore, help maintain an



even temperature in the solutions being filtered. They also exhibit very good resistance to erosion and abrasion.

The series uses the same filtration principle as other filters made by this firm, wherein a rigid synthetic membrane of porous stone is used to support a filter medium. Suspended particles down to 1/10 of a micron are removed.

Portable Industrial Seismograph

A tool to help engineers in their battle against vibration—a portable seismograph—has been developed by the Barry Corp., Cambridge, Mass., and the Westinghouse Electric Corp., Baltimore, Md.

The first application has been made in measuring the vibration of walls in a textile mill. Because of its compactness and easy portability, it is expected that the instrument may be used to analyze vibration problems on machinery and other equipment as well.

The industrial seismograph, so-called because it utilizes the same principle employed

in instruments registering earthquake shock, is a combination of a special seismic pendulum mounting designed and manufactured by the Barry Corp. and the Westinghouse Vibrograph.

The vibrograph, about the size of an ordinary box camera, ordinarily embosses a permanent record of vibrations on a transparent film. It records over the range of 600 to 15,000 cycles per minute and amplitudes as low as one ten thousandths of an inch or as great as one sixteenth of an inch. Mounted in the Barry frame, vibrations with a frequency as low as 120 cycles per minute can be measured even in swaying buildings where no steady reference point is available.

Smoke Density Recorder

An electronically operated smoke density recorder, which accurately measures and records the density of smoke or dust in flues or ducts, has been developed by the Bailey Meter Co., Cleveland, Ohio. The records obtained prove compliance with smoke ordinances and, under certain conditions, give the first warning of faulty combustion conditions in furnaces. The instrument consists of a standard Bailey electronic recorder, a bolometer type smoke detector and a sealed beam light source.

The bolometer type smoke detector and the sealed beam light source are used as the primary element. They are installed on

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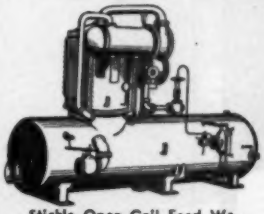
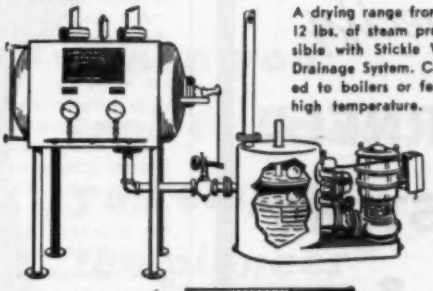


Stickle Open Coil Feed Water Heaters for pulp and paper mills.



A drying range from 15" of vacuum to 12 lbs. of steam pressure is made possible with Stickle Vacuum Differential Drainage System. Condensate is pumped to boilers or feed water heater at high temperature.

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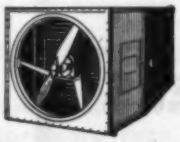

Stickle Heat Reclaimer provides heated water for processing by using heat from paper machine vapor.

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Ask for Stickle Bulletin No. 160 and 160-A for complete information about Stickle Systems for paper mills. A Stickle engineer will consult with you on problems involving drainage and control upon request without obligation.

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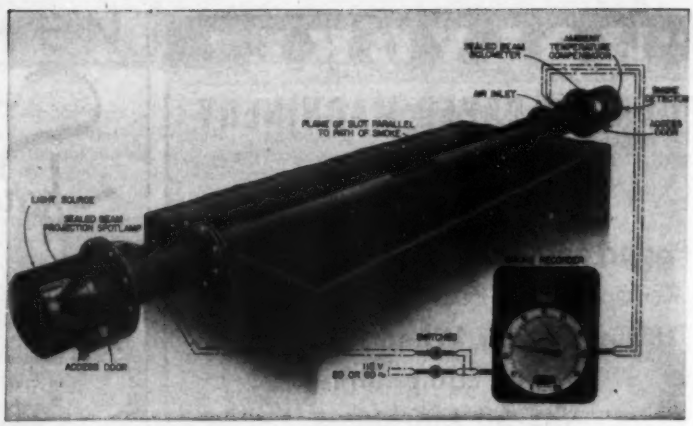

opposite sides of the smoke passage so that the beam from the light source is directed at the tungsten filament of the bolometer. The amount of radiation reaching the filament is dependent upon the density of the smoke or dust; and the temperature of the filament is dependent upon the amount of radiation reaching it. The filament temperature is measured by the electronic recorder in terms of smoke density.

A temperature compensating circuit eliminates errors due to high ambient temperatures, and is unaffected by normal voltage variations. The bolometer is of sealed beam construction to resist the unusual corrosive vapors found in flues.

The voltage drop across the bolometer filament is balanced against the voltage drop across a motor driven slidewire unit in the recorder casing. When the temperature of the filament changes, the potentiometer becomes unbalanced and the slidewire unit is automatically repositioned to restore the balance. The recording pen is directly connected to the slidewire unit and is correspondingly repositioned.

Steam Gun for Cleaning

Designed to facilitate volume cleaning operations in industrial plants, the Oakite Products, Inc., New York, have announced the addition to the company's line of steam-cleaning equipment, the Oakite solution-lifting steam gun, model 481.

The gun, with an over-all length of 5 ft, is ruggedly constructed and so balanced that it may be used over extended periods. Two spade-type, insulated handles are provided on the gun, and are so situated that each of the operator's hands support the

same weight during a high pressure steam-cleaning operation. The forward handle of the gun remains stationary in the operator's grasp as the gun is rotated, while the rear handle is easily turned to rotate the gun when cleaning underneath and hard-to-reach surfaces. Steam and solution hoses are connected to the gun by swivel joints and remain stationary when the gun is rotated, thus eliminating bothersome twisting of hose lines during the cleaning operations. A special safety feature is a reinforced rubber apron backing up the steam valve and other hot fittings to protect the operator from possibility of burning.

Valve Seat Grinder

A new and entirely different valve reseating tool is now available through the Grace Products Co., P.O. Box 2466, Birmingham, Ala. This device employs aluminum-oxide cloth-backed discs mounted on both

faces of a flat steel main body and is operated with an ordinary brace or hand drill equipped with a screwdriver bit. One side of this reseating tool, marketed under the name *Pivot,* has a coarse abrasive disc and the other side a disc of finer grit.

Being reversible, the pitted or wire-drawn seat can be rapidly ground with the coarse side and a mirror-like finish put on with the fine disc. The abrasive discs can be changed quickly. On each face is a steel disc which guides tool in valve seat and it is not necessary to disturb the stem packing.

While especially designed for the regular types of globe, angle, check and gate valves, Pivot seat grinders will work equally well on many other types of equipment such as closet flush valves of both the diaphragm and piston type. Because of its construction, the Pivot reseater is self-aligning and no slivers or metal chips result from the grinding operation.

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in American and foreign press.

Filler Retention in Paper

The following loading materials are discussed:—talc, asbestos, asbestine, kaolin, bentonite, calcium sulphate, barium sulphate, satin white, titanium oxide, zinc pigments, calcium and magnesium carbonates and various ochres. Analytical methods are described for determining the retention of these various fillers, and the mechanism of retention is discussed. A few individual experiments are described such as the percentage retention of a series of loading materials by a specific unbleached sulphite pulp. In this case asbestine was retained to the greatest extent (63%) and gypsum showed the lowest (13%) retention. However the filler retention is contingent on the nature of the fibrous material used in the papermaking operation.

For example, a mechanical pulp retained 71% of the added talc, whereas a cotton pulp retained only 40%. Similar variations in retention were also observed with Kaolin. Between the extremes of retention by mechanical and cotton pulps lay a series of chemical pulps, and the author has listed the pulps in order of their filler retentivities.

The condition in which the fibers are present in the pulp and its effect on retention are also discussed, and effects of the following on filler retention are also given: *p*H, rosin, sodium silicate, starch, temperature, stock density, and the order in which the components are added in charging a beater. When the *p*H is about 5, filler retention seems to be at its best. The effects of rosin or of sodium silicate are very slight.

What appears to be the most favorable order of addition to the beater is the following: pulp, sodium aluminate (if any), loading material, size, and alum. Filler retention appears to increase with increasing square meter weight of the sheet. The effects of loading matter on brightness, gloss, thickness, opacity, glueing properties, moisture content and paper strength are also emphasized. P. Goldsmid. *Papeterie* 70, 34-5, 37, 39, 41, 107-9, 137, 139-40, 229-31, 269-71, 314-15, 317 (1948) (In French).

Jute Fiber, a Supplementary Source of Alpha Cellulose

Having many useful applications in textile manufacture, jute cannot be considered as a replacement for cotton linters as a source of cellulose. On the other hand, jute waste might supplement alpha-cellulose production in India. The lignin of jute is removed readily by treatment with 0.7% sodium chlorite (at 100 deg.), furnishing holocellulose, which when treated with aqueous 9.3% NaOH at room temperature gives an alpha cellulose suitable for rayon or cellulose acetate manufacture. P. B. Sarkar. *J. Sci. Ind. Research* (India) 7B No. 2, 21-4 (1948) through *Bull. Inst. Paper Chem.* 19, 320 (1949).

Phenol Sorbed by Sprucewood

A. Hillmer and other investigators have shown that wood may be pulped by means of phenol in the presence of catalytic amounts of mineral acids (or halogens). The present authors have made quantitative studies of the phenol fixation by sprucewood, using first, solutions of phenol and HCl in xylene, and finally, nearly pure phenol alone (in the presence of HCl). The irreversible fixation of the phenol may reach 0.22-0.24 g. per 1 g. of dry wood. The authors studied the effect of time, HCl concentration and temperature on phenol fixation and found that when 10-12 g. (dry) wood meal was treated with 100-110 g. phenol and 0.63 cc. of HCl at 80 C., 1 g. wood bound 0.22 g. phenol after about 3 hours. In this case the ether-soluble portion of the phenol treated wood was 0.28 g. (per g. dry wood). When the time of treatment was limited to 1 hour, a concentration of 1.34 cc. HCl gave nearly the same per cent phenol fixation (0.21 g. phenol/g. wood). This was not increased by increasing the acid concentration to 2.68 cc., but the ether soluble portion of the treated wood rose to about 0.32 g./g. In a series of experiments in which only 0.08 cc. HCl was used, for 1 hour, the irreversible fixation of phenol rose with rising temperatures. Methods used for determining phenol fixed by the wood (and of ether soluble phenolic bodies) are fully described. A. Wacek and G. Eisner. *Monatshefte für Chemie* 79, 564-9 (1948). (In German).

Effect of Submersion in Water on Decay of Pine

Exposed surfaces of partially submerged pine wood decay readily and are apt to also become "blue-stained." Completely submerged wood however resists the attack of wood destroying fungi more or less indefinitely. It is not generally known whether or not this resistance to decay will continue after the wood has once been withdrawn from the water, particularly whether the wood shows resistance to cellulose and lignin-destroying microorganisms.

The author describes orienting experiments in this field. Small sapwood pine samples [1.5 X 2.5 X 5 cm.] were used. After their dry weight had been determined, ten such pieces were submerged in water which was change once every 24 hours. The samples were held in place by means of a screen. Another ten samples were kept in water that was *not* changed throughout the entire testing period. Another ten test pieces were kept as controls. After soaking six months, the various test pieces were removed, dried and weighed and placed in Kolle flasks on pure cultures of the following:—*Coniophora cerebella, Lentinus lepideus, Lenzites sepiaria,* and *Trametes serialis.*

The experiments (after culturing) required three months. At the end of this period, the specimens were removed from the culture flasks, freed from mycelium, dried and reweighed. The tests were then repeated in the same way. Different fungi appear to behave quite differently. The results are tabulated. The rate of decay in those test pieces whose water was changed daily was only slightly less than that of the controls, and these differences do not appear to be very significant. However, the specimens that were submerged and from which the water was not removed behaved differently—depending upon the fungus used in the test. *C. Cerebella* attacked the wood just about as readily as with samples whose water was changed daily. The other fungi however hardly attacked the wood at all.

The author believes that during this long soaking some antibiotic substances are formed in the wood by certain microorganisms, and that these later inhibit the activities of some of the fungi, whereas other fungi are not as readily affected. *Lentinius lepideus* seems to be the least resistant to this antibiotic attack, and this fact is significant because this fungus is *very* resistant to various wood preservatives. This theory (of antibiotic compound formation) however will have to be tested out by means of far more intensive investigations. O. Suolahti.. *Finnish Paper and Timber J.* 30, No. 19, 341-2 (1948) (The original is in English). Through *B.I.P. Chem.* 19, 282 (1948).

▼

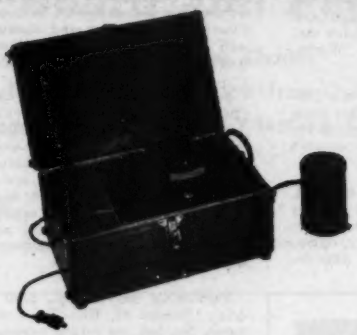
Chromium Plating . . . . .

(Continued from page 1831)

9) It is not a cure-all but rather, has a definite and established place in the paper and pulp industry where its value has been definitely proven. Much more serious consideration should be given to its proven status by engineers designing new machinery. There is readily obtainable technical data on innumerable instances of its successful application.

Of course the question on which most mill men need to be assured is the matter of risk and dependability. Chromium plating is only twenty-five years old and there are still memories of plating that was dissolved by hydrochloric acid, chipped by mechanical pressure or scored by doctor blades. With the ordinary methods of the plater with limited facilities and lack of operating knowledge these things have occurred. However, the specialist has now gathered information on the nature of corrosives that are commonly met, the proper doctor set up, the proper cleaning, operating, and maintenance procedures, etc. In particular, for rolls and dryers, the specialist has installed equipment and special procedures, that ties the plating to the underlying metal with a strength that is so great that a chip will not be dislodged except when the underlying metal itself is fractured. Small damages to plated surfaces can usually be replated and polished out over a week-end without removing the roll from position. Although the plated surfaces usually stay bright and actually improve in service, it is nevertheless quite feasible to repolish a worn surface over the week-end without removing the roll from position.

PHOTOVOLT
Photoelectric REFLECTION METER



For accurate measurement of

BRIGHTNESS
GLOSS
OPACITY
COLOR

of paper and paper products.
Portable, rugged, simple to operate.

Write for literature

PHOTOVOLT CORPORATION
95 Madison Avenue New York 16, N. Y.

"Coes" KNIVES

"COES" Knives for all types of cutting machines. Special knives to customer specifications.

"COES" Type 3 alloy cutting edge, assures maximum service between grindings, workmanship, material and accuracy of dimensions are guaranteed.

SINCE 1830 Coes LORING COES COMPANY
WORCESTER • MASSACHUSETTS
MICRO GROUND

Back for More

At the end of the late war, one large newsprint concern had two Bauer Pulpers operating on screen rejects in two of its mills. Today those two mills have a total of 10 machines, and five additional Bauers have been ordered for a third mill. *Back for more.* These machines were purchased with a first-hand knowledge of what their returns would be. The extra quality of the fiber produced gives them a better sheet and each Pulper is turning out several hundred dollars' worth of valuable pulp each day from screenings.

A felt mill used five Bauers as refiners until 1947. Today they have twelve Pulpers fiberizing semi-chemically cooked chips as a partial furnish for their enlarged facilities. *Back for more!*

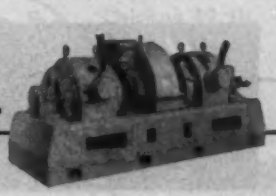
A towel and napkin plant installed one Bauer Pulper in January. By March they had purchased a second and were so pleased with results that by September they ordered 4 more. *Back for more!*

Satisfied users? YES! That's what brings them *BACK FOR MORE!*

For the production of long, pliable, free fiber from a wide variety of raw material sources for almost every grade of finished product, the Bauer is outstanding. The repeat orders above confirm that statement. Address your inquiry for detailed information to

THE BAUER BROS. CO.
SPRINGFIELD, OHIO

Bauer



New Catalogues and Publications

American Cyanamid Company, Paper Chemicals Dept., 30 Rockefeller Plaza, New York 20, N. Y.—Now available from this company is its Technical Bulletin No. 21, "Azite Liquefier 900," describing its product for fluidification of various coating adhesives and preservation of paper strength.

American Hoist & Derrick Co., St. Paul 1, Minn.—Write the advertising department of this company for Catalogue No. 600-L-5, which illustrates its 25-ton Diesel locomotive crane in action in magnet, bucket, hook and pulpwood work. Photos of important mechanical features are also included.

Black-Clawson Co., Hamilton, O.—An interesting booklet entitled "Pulpineering," issued by this organization, narrates the history of pulping paper stock from ancient times to the present. It is illustrated with drawings and photos. Write either Shartle Bros. Machine Co., Middletown, Ohio, or Dilts Machine Works, Fulton, N. Y., for a copy.

Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.—A circular is now available from this company on its "John Crane" packing for the chemical industry. One section is devoted to packings for paper industry.

Mathieson Chemical Corp., 60 E. 42nd St. New York 17, N. Y.—Just published by this company is a 32-page illustrated booklet, "Mathieson Chemicals," covering the history, operations and products of this company. Also included is a description of the recently developed stationary mercury cell for the production of chlorine and caustic soda.

Monsanto Chemical Co., St. Louis 4, Mo.—A valuable addition to the reference file of users of plastics and plasticizers is the booklet recently issued by this company, "Monsanto Plasticizers." Tables and charts in colors, as well as photos, are used to illustrate the text. Requests must be made on company letterhead.

Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles 31, Calif.—Comprehensively described and illustrated in bulletin, No. B-1300, is the company's Type A line of horizontal centrifugal pumps, for general purpose pumping of water and alkaline fluids at temperatures up to 300 deg. Fahr. It is complete with schematic sectional drawings, application photos, sectional and dimensional drawings, and tabulated material on all sizes in the line.

Perfecting Service Co., 6140 Cottage Grove Ave., Chicago 37, Ill.—The new 20-page catalogue, No. 500, on rotary unions, issued by this company contains engineering information unobtainable elsewhere. It shows how to cut power costs, reduce maintenance and get better results on dryers, calenders, cooling rolls, coaters and other papermaking machinery. The booklet covers both syphon and plain pumps.

H. K. Porter Co., Inc., J. P. Devine Div., Pittsburgh 22, Pa.—Now available from this company is Catalogue No. D-45-A, on its Devine vacuum chamber dryers. Sectional drawings, photos and charts are used to illustrate the text.

Sarco Co., Empire State Bldg., New York 1, N. Y.—In Technical Bulletin No. 3, "Draining and Air Venting Paper Machine Cylinders," is a discussion of the requirements of draining and air venting paper machines and the deficiencies in many methods now in use.

Taylor Instrument Companies, Rochester 1, N. Y.—A new 12-page bulletin, "Taylor Load Measuring Instruments for Paper Machine Presses, Heavy Duty Presses, and Supercalenders," has been released by this company. It has been designed to show how engineered instrumentation can aid in eliminating guesswork from press roll operation, and also help to reduce drying and felt costs. The bulletin includes application drawings and photos. Ask for No. 98114.

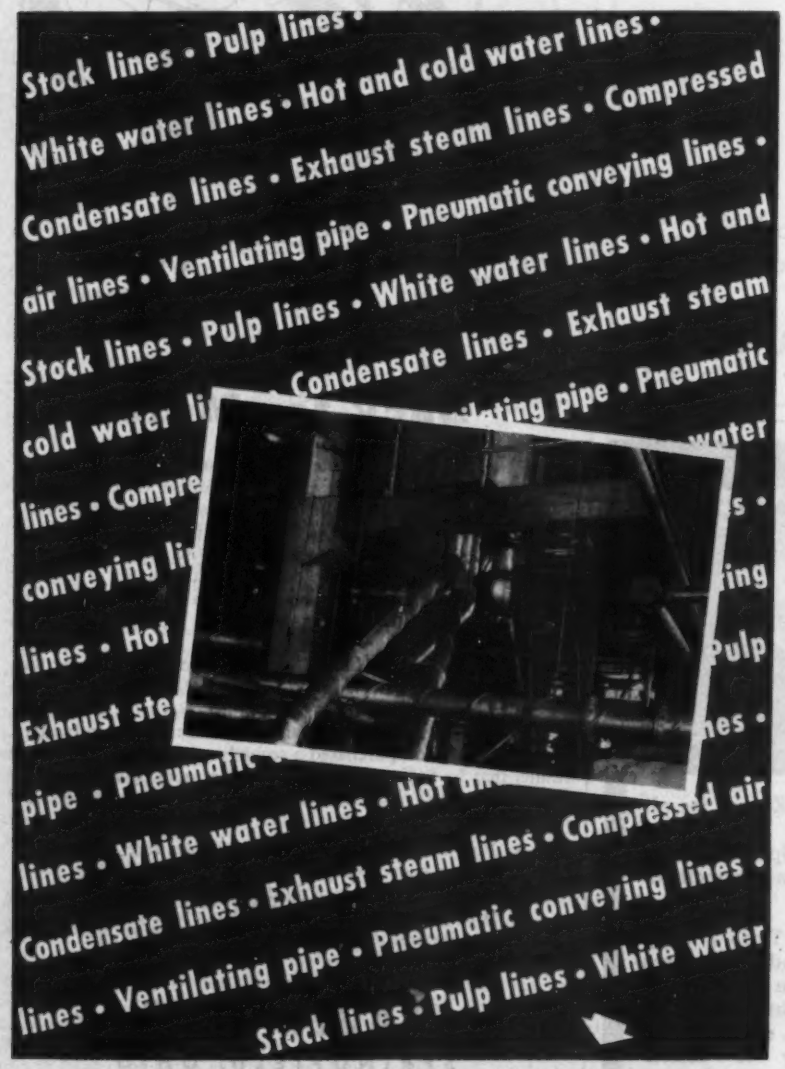
Westinghouse Electric Corp., East Pittsburgh, Pa.—Recently published by this company is booklet on "Westinghouse Sectional Motor Drives for Paper Machines." It contains a thorough description of the many features available in this new drive. Photos, drawings and a chart for estimating power requirements add to the value of the book.

Books

The Mathematical Solution of Engineering Problems (Reviewed by D. S. Davis)—Mario G. Salvadori, assisted by Kenneth S. Miller, has given us an exceptionally lucid and timely text in an important subject. This presentation should appeal to engineers that have not lost touch with hard-earned mathematical techniques. Thoroughly tried out in the Engineering School at Columbia University, the book opens with review material concerned with natural, imaginery and complex numbers and with the fundamentals of college algebra and analytical geometry. Succeeding chapters offer ample coverage of algebraic and transcendental functions, determinants and the engineering application of the Fourier series. The usual mathematical courses given engineers are prerequisites to an adequate appreciation of the book.

The practical needs of the reader are met with nearly 400 problems of which a generous number are wisely strengthened with answers. The line drawings are good, the index is satisfactory and the text matter is mathematically rigorous but not dull. The adroit illustrations used to highlight imaginary numbers and discontinuous functions are most commendable.

Priced at $3.50, the book may be purchased from the McGraw-Hill Book Company, 330 West 42nd Street, New York 18, N. Y.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Sizes from 4" to 30" in diameter with all types of fittings, connections and fabrications.

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COLORS . . .
for Board and Paper

Green Chromium Oxides
Black, Brown, Red, Yellow Iron Oxides
Lamp Black—Umbers—Venetian Reds
Yellow Ochres

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Easton, Pa. - East St. Louis, Ill.
Emeryville, Calif.

MEN WANTED—POSITIONS OPEN: We have inquiries for the following men: manager of manufacturing for specialty papers, tissues, paper board and newsprint, large mill, excellent salary; assistant superintendent laminating and coating plant; technical superintendent; night superintendent especially good on beaters, machines and colors for colored sulphite writings and specialties; chemists and chemical engineers, one with Ph.D. degree; laboratory assistants; superintendent wood storage and preparation; machine tenders and back tenders; assistant to chief power engineer; instrument engineer; designing engineer; electrical engineer; industrial engineer. We invite correspondence (confidential) with mills seeking executives and with executives seeking new positions.

CHARLES P. RAYMOND SERVICE, Inc.
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WANTED—Eastern manufacturer of carbon products has opening for sales representative familiar with paper machinery and steam operations to cover all industries using carbon rings and seals. Territory to cover Eastern shore and as far west as Mississippi. Salary and bonus basis. Address Box 481, Fritz Publications, Inc.

WANTED—Used English or Pope type reel, 86" to 110" face, in good condition. Address Box 482, Fritz Publications, Inc.

Toilet Roll and Towel Roll
Wrapping Machines - - - Banding Equipment
Write for complete information
THE PHOENIX GAGE COMPANY — Phoenix, New York

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Builders
GREENSBORO, N. C. ANDERSON, S. C.
Paper & Pulp Mills • Waste Disposal • Water Filtration
Steam Power Plants • Process Piping • Textile Mills
SERVING THE INDUSTRIAL SOUTH for MORE THAN FIFTY YEARS

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SHOULD HAVE
THIS NEW FREE BOOK
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Of vital interest to every paper producer are the proved advantages of Glidden soya proteins in paper coating and sizing. Processing may be expedited, quality improved, costs cut. In some cases, *all three benefits* ensue.

If you are not yet acquainted with the advantages of Glidden Alpha* Protein and Prosein* as adhesives for pigments in paper coating and of the Glidden Prosize Process for paper sizing . . . write for this book today. It's a concise, yet complete treatment of facts you should have. It's written in interesting, understandable form. And it's *free!*

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5165 West Moffat St.
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"What've Calender Rolls got to do with me?"

"I'm only a printer. Calender rolls are not in my line! What has the finish to do with me?"

A great deal, Mr. Printer. Finer calendering with Butterworth Calender Rolls produces better finishes and better paper for printing jobs.

Butterworth Rolls are made of the finest materials available, long staple cotton free of any foreign matter and top quality paper of high rag content.

Put a Butterworth roll in a stack with any other roll. Check its performance. You'll see the difference in longer service, in less labor time spent in making changes. Butterworth Rolls are locked on the shaft under tremendous pressure. Can't slip or come loose. Pretested for smoothness, hardness and density.

Whether you do plain calendering, heavy duty friction work, schreiner, embossing or chasing work, Butterworth Calender Rolls will give you many additional hours of top flight service. Call us on your calendering problems. We make Calender Rolls in every size for all types of calendering, or we can refill your present rolls.

For full information, write or call H. W. Butterworth & Sons Company, Philadelphia 25, Penna. — Providence Division, Providence, R. I. : : Charlotte, N. C., 1211 Johnston Building In Canada—W. J. Westaway Company, Hamilton, Ontario

Butterworth Calender Rolls

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Blue Overalls	7.50 to 7.75
Corduroy, Men's	6.00 to 6.25
Corduroy, Ladies'	6.00 to 6.25
Washables, No. 1	4.50 to 4.75
Percales	6.50 to 6.75
Light Prints, No. 1	6.25 to 6.50
Khaki Cuttings—	
Bleachable	6.25 to 6.50
Unbleachable	5.50 to 5.75
New White Canvas	11.50 to 12.00
New Mixed Blacks	5.25 to 5.50
Canton Flannels, Bleached	10.75 to 11.00
Shirt Cuttings—	
New White No. 1	10.75 to 11.00
White Shrunk	10.00 to 10.25
Silesias No. 1	8.50 to 8.75
New Unbleached	11.00 to 11.25
Fancy	6.00 to 6.25
Linen Cuttings—	
American	8.00 to 8.50
White	14.00 to 15.00
Grey	13.50 to 14.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.25 to 1.30
No. 2	1.15 to 1.20
No. 3 and No. 4	.95 to 1.05
Twos and Blues—	
Repacked	3.00 to 3.25
Thirds and Blues—	
Repacked	2.85 to 3.00
Miscellaneous	2.25 to 2.50
Whites, No. 1—	
Repacked	4.75 to 5.00
Miscellaneous	4.00 to 4.25
White, No. 2—	
Repacked	3.50 to 3.75
Miscellaneous	2.75 to 3.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shapperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Bunny No. 1—	
Foreign	Nominal
Domestic	8.50 to 9.00
Wool Tares—	
Light	8.00 to 8.50
Heavy	8.50 to 9.00
No. 1 Scrap Bagging	6.50 to 7.00
Manila Rope—	
No. 1 large	6.00 to 6.25
No. 1 small	5.00 to 5.25
Sisal Rope—	
No. 1 large	5.50 to 5.75
No. 1 small	5.00 to 5.25
New Burlap Cuttings	8.50 to 9.00
Jute Threads—	
Foreign (Nom.)	6.50 to 7.50
Domestic	6.00 to 6.50
Strings—	
No. 1 sisal	5.00 to 5.25
No. 2 sisal	4.50 to 4.75
Soft jute	4.25 to 4.50
Mixed	2.50 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	95.00 to 100.00
Hard White, No. 1	80.00 to 85.00
Soft White No. 1	65.00 to 70.00
Soft White, one-cut	85.00 to 90.00
Soft White, Misc.	55.00 to 60.00
Fly Leaf, No. 1	30.00 to 35.00
Fly Leaf, Woody, No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines	18.00 to 19.00
Mixed Books	13.00 to 14.00
Ledger Stock—	
No. 1 White	40.00 to 45.00
No. 1 Mixed (Colored)	30.00 to 35.00
Manilas—	
New Env. Cuttings	60.00 to 65.00
New Env. Cuts, One-Cut.	—
Extra Manilas	—
Manila Tab Cards, Free of Ground Wood	65.00 to 70.00
Colored Manila Tab Cards	40.00 to 45.00
Kraft—	
New Envelope Cuttings	65.00 to 70.00
Tripled Sorted No. 1 100%	35.00 to 40.00
New 100% Cor. Cuts	35.00 to 40.00
No. 1 Old Assorted	25.00 to 30.00
News—	
White Blank	65.00 to 70.00
Overissue	17.00 to 18.00
No. 1 Baled	13.00 to 14.00
Old Corrugated Containers	14.00 to 15.00
New Jute Corrugated Cuts	20.00 to 21.00
Mill Wrappers	8.00 to 9.00
Box Board Chips	6.00 to 7.00
No. 1 Mixed Paper	6.00 to 7.00

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.05—
Ground, cwt.	3.90—
Powdered, cwt.	4.20—
Blanc Fixe—	
Pulp, bulk, ton	77.50—
Dry, barrels	85.00—
Bleaching Powder—	
Drums, cwt.	4.25 to 4.50
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	26.00 to 29.00
Argentine, lb.	24.50 to 25.50
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	15.00 to 25.00
Imported (ship side) Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.40 to 2.70
Gelatine (silicin), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	39½ to .40
Litharge, powd., bbl. lb.	.23 to .24
Rosin (Gum)—	
New York, per 100 lbs.	
E	7.65—
F	7.65—
G	7.65—
WWX	8.25—
Rosin (Wood), carlots	6.25—

MARKET QUOTATIONS

Salt Cake—
Dom. bulk (wks) ton . . . 26.00 to 28.00
Imp. bulks on dock—
(Atl. ports) ton (Nom.) 27.00 to —

Soda Ash—
Bulk (works), cwt. . . . . 1.10 to 1.20
Paper Bags, cwt. . . . . 1.30 to 1.40
Barrels, cwt. . . . . 1.70 to 1.80

Soda (Caustic)—
Solid drums, cwt. . . . . 3.05 to 3.10
Ground and flake, drums, cwt. . . . . 3.45 to 3.50

Sodium Silicate—
60 deg., 55 gal. drums, (works) cwt. . . . . 1.65 to 2.05
40 deg., 35 gal. drums, (works), cwt. . . . . .80 to 1.45

Starch—
Pearl, 140 lb. bags, cwt. 4.67—
Pearl, barrels, cwt. . . . . 4.67—
Paper, (Sp.) bags, cwt. . . 4.67—
Powdered, barrels, cwt. . . 4.78—

Sulphur (Crude)
(Mine) bulk, long ton... 16.00 to 18.00

Talc—
Dom. 100 lb. bags (mine) ton . . . . . 22.00 to 28.00
Canadian . . . . . 35.00 to 45.00

Titanium Dioxide—
Barium Pig. bbls., lb. . . 18 to .19½
Calcium Pig. bbls., lb. . . 18 to .19½

Zinc Sulphide, bbls., lb. . . 11.50 to 11.75

WOOD PULP

Prices, dollars per short, air dry, ton, on dock American ports and f.o.b. shipping points with former OPA freight allowances, are:

Bleached sulphite, Swedish. 165.00—
Bleached sulphite, Finnish. 165.00—
Bleached sulphite,dom. . . .126.00 to 135.00
Easy bleaching sulphite. . . . —
Unbleached sulphite, Swed. 140.00 to 143.00
Unbleached sulphite, Fin. . 140.00 to 143.00
Unbleached sulphite, dom. 118.00 to 130.00
Unbleached kraft, Swedish.127.50—
Unbleached kraft, Finn. . . 127.50—
Unbleached kraft, northern 115.00 to 125.00
Unbleached kraft, southern 105.00 to 120.00
Bleached sulphate, Swedish 150.00 to 165.0
Bleached soda, domestic . 130.00 to 135.00
Sulphite screenings, dom. . 40.00 to 50.00
Sulphate screenings, dom. 40.00 to 50.00
Groundwood, domestic and Canadian . . . . . 80.00 to 85.00

PAPER

f.o.b. New York City

Boards—	per ton
Binders	94.00—
Chip	80.00—
Chip, tube and can	85.00—
Chip, full blending	87.50—
Chip, sgl. mla. lined	85.00—
Coated, white patent .018	120.00—
.020 and heavier	110.00—
Kraft liner	79.00—
Filled News	82.50—
Container	90.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)
Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	14.85—
B Grade E. F.	14.55—
A Grade S. C.	15.35—
B Grade S. C.	14.95—
No. 2 Uncoated Offset 4 sides. White	—
Machine Coated White (Trimmed 4 sides)	
No. 1 Glossy	20.15—
No. 2 Glossy	18.90—
No. 3 Glossy	18.25—
No. 4 Glossy	—
No. 2 Offset	14.60—
C1S Lithe (Varnish)	—
C1S Lithe (Non-Varnish)	—

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—

(In Ton Lots)	per cwt.
Extra 100% Rag	52.20—
100% Rag	46.20—
75% Rag	36.70—
50% Rag	29.50—
25% Rag	20.35—

Rag Content Ledger—

(In Ton Lots)	per cwt.
Extra 100% Rag	50.50—
100% Rag	44.50—
75% Rag	36.70—
50% Rag	29.50—
25% Rag	20.25—

Sulphite Bond—

	per cwt.
Air dry, watermarked	—
No. 1 watermarked	18.50—
No. 2 watermarked	17.55—
No. 4 watermarked	16.85—

Sulphite Ledger—

	per cwt. Zone 1
No. 1 watermarked.	18.85—
No. 2 watermarked.	18.05—
No. 4 watermarked.	17.35—

Glassine (f.o.b. mill)—

	per cwt
Embossed (25 lbs. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof—	
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—

News—

	per ton
Rolls, Standard (Contract)	100.00 to 103.00
Rolls (Spot)	(Nominal)
Sheets	119.00—

Tissues (Carlots)—

	per ream
White No. 1	1.85—
White No. 2	1.65—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.75—
Manila	1.40—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.80—
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.80—
Toilet, Bleached (M. shts.) per cs.	8.75 to 10.00
Toilet, Unbleached (M. shts.) per cs.	7.50 to 10.00

Towels—

	per case
Bleached	4.75—
Unbleached	4.00—

Wrappings (Kraft)—

	per cwt.
Super-Standard	9.00 to—
No. 1 Wrapping	7.50 to 8.00
Standard Wrapping	7.00 to 7.25
Standard Bag	6.50 to 7.00
Variety Bag	—

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)

Bleached Papers—

	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only (10,000 lbs.)	—
Drug wrapp., 35 lb.	—

Unbleached Papers—

Com. Gr. Butch. 40 lb.	—
No. 1 Butchers	—
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—

Manilas—

Envp. Mla., Sub. 16-40 (No. 1)	—
Envp. Mla., Sub. 16-28 (No. 2)	—
Envp. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	—
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B20 lb.	—
Grade A-22 lb.	—

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ROGERS "NT" KNIFE GRINDER
for Every Need!

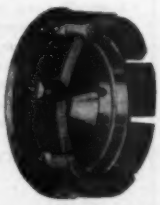
Capacities for Knives:
38"
48"
68"

NT-160 above

78"
90"
102"
110"
122"
134"
154"
160"
190"
220"

EASY, FAST, Cost-Saving Production

Enjoy the low cost freedom of precision grinding. A wide range of sizes for grinding any length paper or straight knife. Extremely versatile . . . grinds on edge or face, any bevel, flat or concave, wet or dry. Heavy duty construction throughout from cabinet base to rugged 7½ HP grinding head motor. No experienced operator required. Write for bulletin giving full details.



16" SEGMENTAL GRINDING WHEEL

Spaces between segments carry off abrasive and steel particles, —assure faster, cooler cuts, coolant reaches grinding contact.

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Please send further information on your "NT" Knife Grinder.

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Bauer Bros. Co., The 1837
Beloit Iron Works
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Bucyrus-Erie Company
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Carthage Machine Co.
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Chicago Bridge & Iron Company 1686
Chicago Electric Company 1823
Chicago Metal Hose Corp.
Chromium Corp. of America
Clark Equipment Company, Industrial Truck Division 1775
Classified Advertising 1839
Cleary Corporation, W. A. 1811
Coes Company, Loring 1837
Continental Foundry & Machine Co.
Crane Co. 1733
Crane Packing Company

Darnell Corporation, Ltd. 1834
Dempster Brothers, Inc. 1768-1769
DeZurik Shower Company
Dietert Company, Harry W.
Dilts Machine Works 1758
Diston & Sons, Inc., Henry 1703
Dodge Manufacturing Corporation 1763
Downingtown Mfg. Co. ..... 1st Cover
Draper Brothers Company 1776
du Pont de Nemours & Co., E. I.
Duriron Co., Inc., The

Eastwood-Nealley Corporation ..... 4th Cover
Economy Pumps, Inc.
Electric Machinery Mfg. Co.
Electro-Alloys Div., American Brake Shoe Company 1807
English China Clays Sales Corp. 1830

Fawick Airflex Company, Inc.
Ferguson & Co., Hardy S. 1824
Fischer & Porter Company 1709
Fitchburg Screen Plate Co., Inc. 1835
Fleishel Lumber Company
Flexible Steel Lacing Co. 1823
Fritz Publications, Inc. 1811, 1843

Garlock Packing Co., The 1844
General Chemical Division, Allied Chemical & Dye Corporation 1692
Glidden Company, The 1839
Goulds Pumps, Inc. 1773
Graphite Metallizing Corporation 1806
Grinnell Company, Inc. 1701
Guest & Sons, C. M. 1839

Hamilton-Thomas Corp.
Hardy & Son, George F. 1839
Harrington & King Perforating Co.
Harris-Seybold Company
Hercules Powder Company
Hills-McCanna Company
Holyoke Machine Company 1833
Hooper & Sons Co., Wm. E. 1738
Hudson-Sharp Machine Company 1827
Hunt Machine Co., Rodney
Huyck & Sons, F. C.

Infilco, Incorporated 1690
Ingalls Iron Works Company 1813
Ingersoll-Rand Company
International Nickel Co., Inc. 1700

Jeffrey Mfg. Co., The
Jenkins Bros.
Jenssen Company, Inc., G. D. 1824
Johnson Corporation, The 1707
Jones & Sons Company, E. D. 1726-1727
Jones Foundry & Machine Co., W. A.

Kalamazoo Tank & Silo Co. 1799
Kalamazoo Vegetable Parchment Co.
Keico Company 1764
Klipfel Manufacturing Co.

Langston Co., Samuel M. ..... 3rd Cover
Lawton Company, The C. A.
Layne & Bowler, Inc. 1842
Lewellen Manufacturing Co. 1835
Lindsay Wire Weaving Co., The 1735
Link-Belt Company 1729
Lockport Felt Company 1731
Lodding Engineering Corp.
Lukens Steel Company and Divisions 1702, 1791
Lukenweld Division of Lukens Steel Co. 1702
Lunkenheimer Co., The 1781

Magnus Metal Corporation 1825
Maine Development Commission
Mason-Neilan Regulator Company
Mathieson Chemical Corporation 1688
Michigan Pipe Company
Michigan Steel Casting Co. 1819
Midwest-Fulton Machine Co.
Midwest Piping & Supply Co., Inc. 1704
Mission Manufacturing Company
Morden Machines Company 1774
Morey Paper Mill Supply Co.
Mt. Vernon-Woodberry Mills, Inc. 1711
Murray Mfg. Co., D. J. 1817

(Continued on facing page)

Nash Engineering Co., The....1811
National Aluminate Corporation....
National Safety Council, Inc....1829
Naylor Pipe Company....1838
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Norma-Hoffmann Bearings Corp....
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Oliver United Filters, Inc....
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Posey Iron Works, Inc....
Powell Company, The Wm....1795
Pusey & Jones Corp., The....1724-1725

Raymond Service, Inc., Charles P....1839
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Rice Barton Corporation....
Rice Barton Research Corp....1687
Rogers & Co., Samuel C....1841
Rohm & Haas Company, Resinous Products Division....2nd Cover
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R-S Products Corporation....

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Shartle Bros. Machine Co....1758
Shuler & Benninghofen....1706
Smith & Winchester Mfg. Co....1815
Smith Corporation, A. O....
Solvay Sales Division, Allied Chemical & Dye Corporation....
Standard Oil Co. (Indiana)....1779
Stebbins Engineering & Mfg. Co....1802
Stein, Hall & Company, Inc....1817
Stickle Steam Specialties Co....1833
Sutherland Refiner Corporation....1693
Swenson Evaporator Company....
Swift & Company....1708
Syco Manufacturing Company....

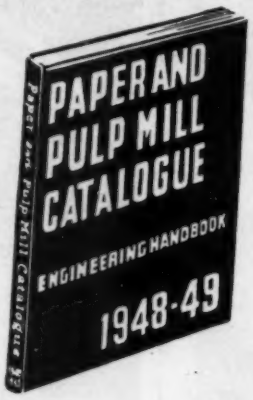
Timken Roller Bearing Co., The....1705
Titanium Pigment Corporation....1694
Torrington Co., Bantam Bearings Division....1793
Trent Tube Company....1714-1715
Turner Halsey Company....1711

Union Pacific Railroad Company....1710
United States Testing Co., Inc....1698
U.S.A.—Treasury Dept....
U. S. Stoneware Company....1821

Valley Iron Works Company....
Vanderbilt Co., Inc., R. T....1716

Waldron Corporation, John....1783
Warren Steam Pump Co., Inc....
Waterbury & Sons Co., H....1835
Waterbury Felt Co., The....
Western Precipitation Corp....1712
Weyerhaeuser Timber Co....1695
Whiting Corporation....
Williams and Co., C. K....1839
Williams-Gray Company....1833
Worthington Pump & Machinery Corp....
Wyandotte Chemicals Corporation....1740

Yarnall-Waring Company....1696



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Infilco Inc.

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Jeffrey Manufacturing Co., The
Johns-Manville
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Johnson Corporation, The
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Jones Foundry & Machine Co., W. A.
Joy Manufacturing Company

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Klemp Company, Wm. F.

Lagerquist & Sons, Gust
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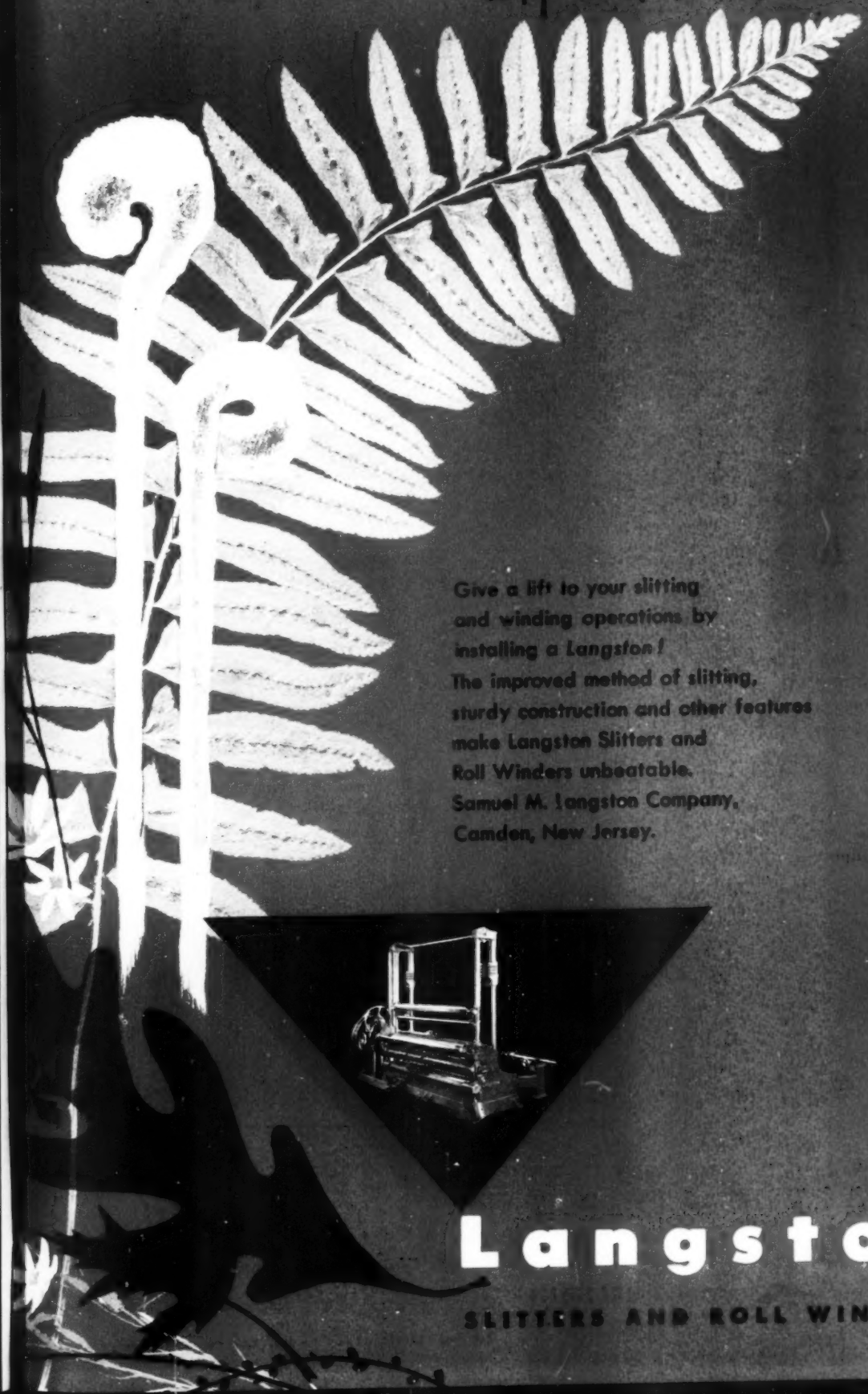

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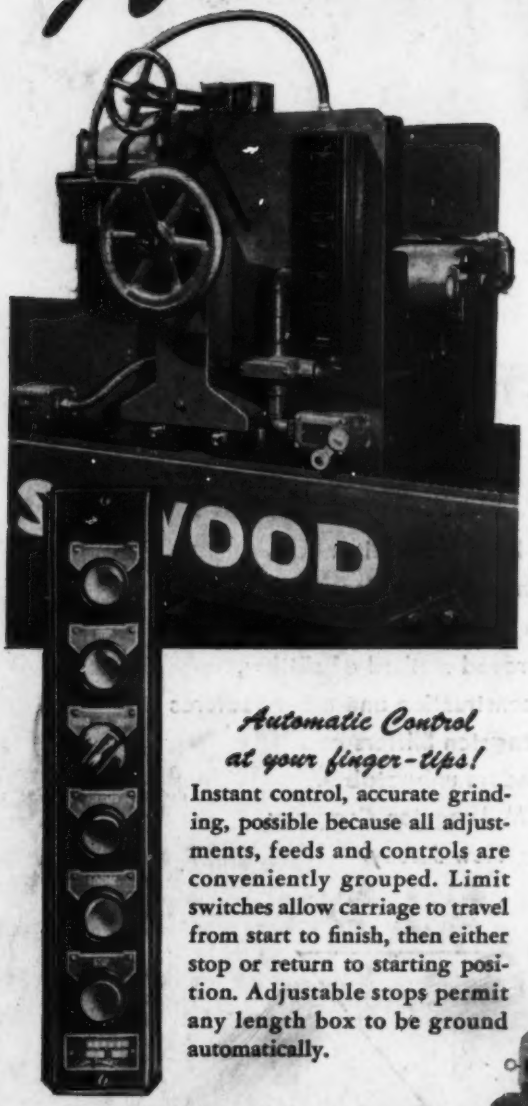

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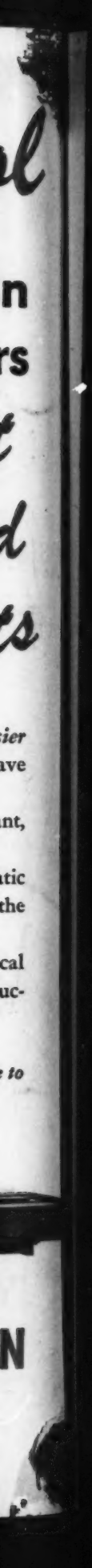
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